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BALTIMORE, MD.

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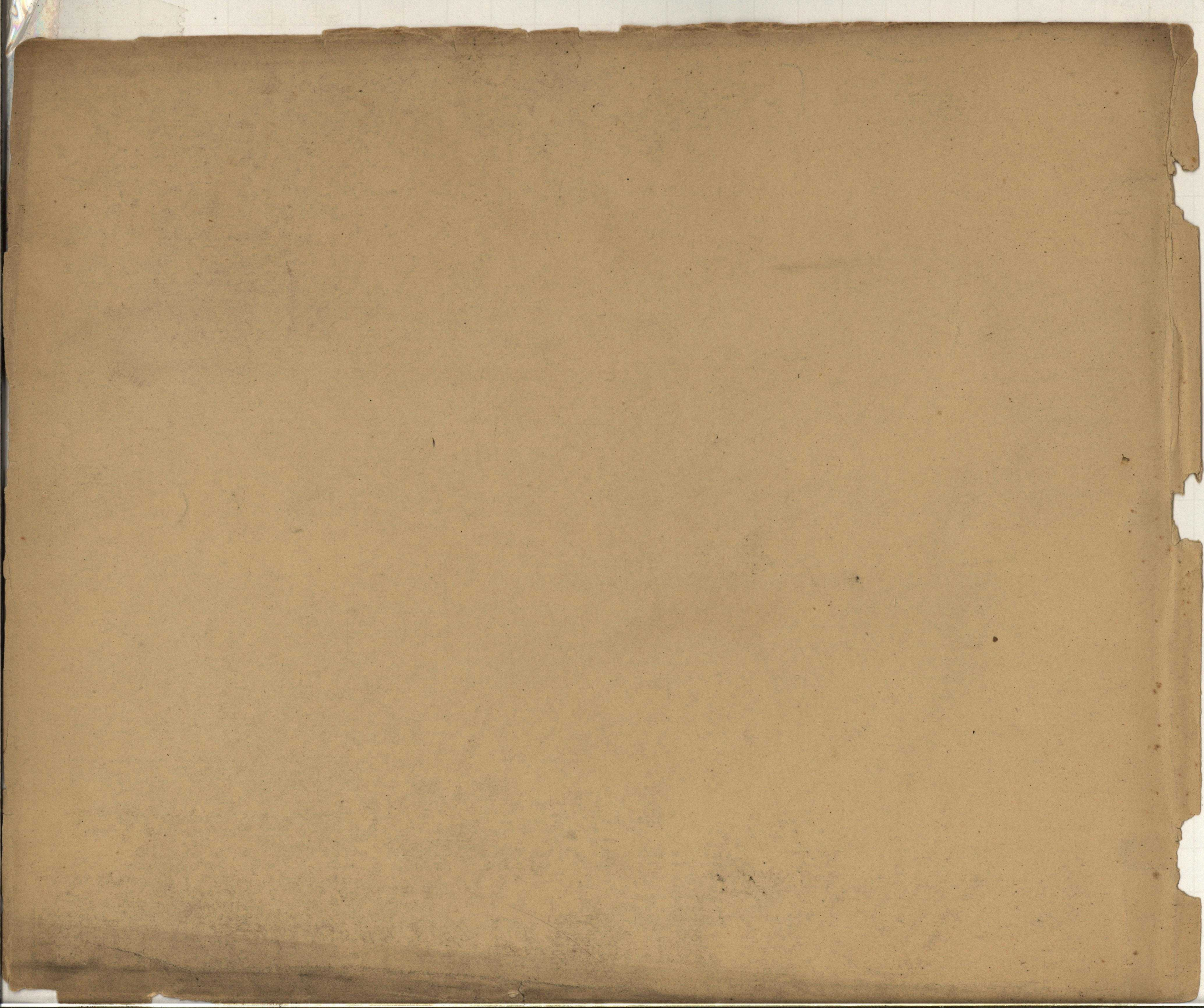
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OFFICE OF BURNS, RUSSELL & CO.,
BALTIMORE, MD.

TO ARCHITECTS AND BUILDERS.

The important position to which Terra-Cotta has attained as a material for architectural and decorative purposes, has induced us to extend our business, heretofore confined principally to the manufacture of plain and ornamental brick, to include this branch of it.

Our brick for the past fifty years have had a high reputation for beauty and durability, and have been used in the construction of prominent buildings in many of the principal cities of this country. Illustrations, which we have been able to obtain of some of these buildings, we present herewith, together with designs of our Moulded Brick Shapes, and of Terra-Cotta, which we have furnished to buildings in this city and elsewhere.


Of the beauty of Terra-Cotta ornamentation for brick buildings, there can be no question. As to its durability and cost, compared with stone, the whole subject is so admirably presented in the following Treatise of Mr. James Holroyd, that we publish it in full.

A perusal of this Paper will exhibit to you the various advantages of Terra-Cotta for decorative application, and will also enable you to understand the difficulties to be encountered in producing thoroughly good work.

We ask you to read this carefully, and particularly call your attention to the following observations of the author: "The only satisfactory method in Terra-Cotta work is to anticipate, as far as possible, the commencement and progress of the structure, the architect making it the subject of special estimate ahead of the general work, thus avoiding the hurry, haste and push so fatal to true work."

We also request you to examine our accompanying designs, promising that we will endeavor to earn for our Terra-Cotta the same high reputation that our brick have so long possessed.

BURNS, RUSSELL & CO.



TERRA-COTTA

AS A MATERIAL FOR CONSTRUCTIVE AND DECORATIVE APPLICATION.

A PAPER READ BEFORE THE LEEDS' ARCHITECTURAL ASSOCIATION BY JAMES HOLROYD.



The Italian term, "Terra-Cotta," by which a certain class of burnt clay or earth is technically known, at once points to the source from whence it derives its present characteristic features as an architectural material. In such relationship its general use dates from the period of the Italian Renaissance, but historically it was known and used in much earlier times. In fact it may be said to be pre-historic in its origin, for it is in some cases almost our only link, with nations of the most remote antiquity. Both in the form of bricks, and in more elaborate constructive and decorative forms, it was evidently largely used by the earliest builders known to us who can lay claim to architectural skill. The remains, fragmentary and otherwise, of both Nineveh and Babylon, as revealed by the researches of Layard, Rawlinson and Porter, clearly reveal its application, and afford not a few specimens of historical, antiquarian and also of architectural significance. Whether, in fact, the remains of the very earliest builders of whom we have record can or cannot be absolutely identified, we are, nevertheless, in the use of Terra-Cotta, merely following in their wake, for we read of the men of the East, when migrating Westward, that "coming to the land of Shinar, they dwelt there, and said one to another, *Let us make brick and burn them thoroughly, and they had brick for stone.*"

It is not my purpose, however, this evening, to touch upon the historical aspect of the subject, although it might well deserve, and would certainly repay attentive consideration. In incidentally alluding to the early authentic use of Terra-Cotta, I merely wish to remark that as an architectural material, we have at least some ancient historical, and not a few fragmentary testimonies to its value; and in considering its modern development and uses, it is not without significance to remember that we are not concerned with something new, but rather with the oldest composite and manufactured material to which we have either historical or fragmentary reference.

That the burnt brick of the Ancients is identical in material with the Terra-Cotta of to-day may seem at first a somewhat bold assertion, yet it is probable that it had a

very close similarity to many varieties of so-called Terra-Cotta. Burnt bricks and Terra-Cotta are, as regards the nature of the material, synonymous terms. The former may be, and sometimes is, the coarser and rougher form, but not necessarily so, and not always so by any means. Technically we apply the term brick to forms of certain, or rather uncertain dimensions and shape, within recognized limits as to size, the maximum limits of size being generally that capable of being handled by one hand in the process of building; whilst the term Terra-Cotta is technically understood to refer to blocks exceeding this maximum, in form more resembling blocks of masonry, moulded in its plastic condition into the required shape and size, and applied architecturally on more or less the same principles of construction as are recognized for the use of stone blocks. This definition may be said to be of general application, but it may be remarked that since the introduction of machinery into making bricks, a decided difference of process in the preparation of the raw material tends considerably to widen the distinction between Terra-Cotta and many classes of bricks.

The manufacture of Terra-Cotta is essentially a plastic process. The manufacture of bricks is not now essentially or necessarily so, for in many districts the raw material is now treated either in what is called the semi-plastic or dry form, and worked into the required shape by mere force or compression without any of the preparatory plastic treatment which gives to Terra-Cotta one of its principal qualifications as an architectural and artistic material. Although it is unquestionable that with certain shales and clays, the dry or semi-plastic process of brick making is capable of producing, and, with suitable treatment, does produce bricks of excellent quality and hardness for building purposes at a very low rate of cost, yet, I think it will not be seriously contested, even by those interested in their production, that apart from the question of cost, they are not entitled to rank with a suitable clay, skillfully treated as a plastic material and made into brick or Terra-Cotta, with due regard to the necessary qualities of a first-class building material.



In our consideration of Terra-Cotta as a material for architectural and decorative purposes, within the limits at our disposal, I think I shall serve best your purpose by describing the nature and quality of the raw material.

The Terra-Cotta, or burnt brick of the Ancients, was probably made of the rich clayey earth or surface clay of the alluvial plains, which, being plastic in its natural condition, was most susceptible of treatment with the simple appliances at their command.

Varieties of the same alluvial formation are still preferred in some districts and countries, not only for the ease with which they are worked in the plastic form, but from their great abundance and ready accessibility at a minimum cost. These surface clays are, however, in many respects, the least desirable variety of the aluminous deposits available for Terra-Cotta. They preserve, indeed, often a high degree of plasticity which is most desirable, but this valuable quality is often neutralized by an absence of strength, which renders them unsuitable for any purpose requiring exactness of form and shape after an exposure to even a low heat in process of burning. As a rule these surface clays being rich in alumina and deficient in silica, are reinforced in process of manufacture by the addition of sand and other siliceous materials, and in some districts it would be impossible to treat the clay in any practical way without this or a similar combination. In not a few instances the material thus prepared is, however, available only for bricks burnt at a low heat either in clamps or ovens, and cannot take a higher rank than a country-made common brick or a London stock brick. In other cases, by the addition of large portions of sand, the tendency to twist and warp in burning is checked, but the product is often rendered very porous and is deficient in the ring and hardness characteristic of a well-burnt material of superior quality.

The shales of the coal measures are in some instances used as a raw material for the manufacture of Terra-Cotta, but these also are often deficient in silica, and are also more or less in combination with carbonaceous and other deleterious substances. They require very skillful treatment to produce a Terra-Cotta of even moderate quality, and are, as a rule, deficient in the color characteristic of purer deposits of clay. The natural clays most favorable to the production of the best Terra-Cotta are those in which silica and alumina bear a proportion of not less than about sixty parts of silica to thirty to forty alumina, with but little more than one or two parts of foreign material, chiefly ferruginous oxide. Such deposits are probably more plentiful than they are actually known to be, but the most important at present available are confined to limited areas, and are not numerous. They are of two or three varieties, viz: The banks or pockets of red marls characteristic of some portions of the Midlands, Stafford-

shire, some parts of Devonshire, with here and there banks of marl similar in formation, but with the coloring oxides more or less absent. These banks or beds are sometimes of considerable thickness, and present several varieties of clay. The thickest I know of is in North Wales, and is probably some hundreds of feet in total depth. It is a remarkably fine bed of red marl. Second, certain anhydrous strata of the coal measures commonly known as fire clays,—material composed of silica in varying proportions from sixty up to seventy parts to the hundred, and the rest of alumina with but small admixture of foreign organic matter,—these strata exist more or less throughout the entire area of the coal measures.

I think I shall not be considered guilty of undue partiality in stating what I believe is generally admitted by those best qualified to judge, that one of the purest strata of this clay hitherto worked in this country is in the Leeds district, and underlies the large area of what is known as the Low Moor or Better Bed Coal. It lies at an average depth of say sixty yards below the surface, and is of an average thickness of about three feet. Having a considerable depth of cover, it is very hard and close in texture, and is obtained only by mining operations by the same methods as coal. An analysis of it indicates great refractile power with almost perfect freedom from foreign matter or organic impurity. It is unquestionably a most excellent base in connection with other material for the production of Terra-Cotta in any form, from the simplest to the most elaborate, inasmuch as it secures: First—The minimum of contraction in drying. Second—Hardness and exactness of form when burnt. Third—Solidity under pressure. Fourth—Clearness of color.

The clays of Dorsetshire have also been largely used for Terra-Cotta, and they are for the most part an excellent, clean and plastic material, but they are too deficient in silica to be used without considerable admixture. Although when in suitable combination they make excellent stoneware, and are invaluable to the potter, they are less desirable for architectural work.

It will be inferred from what I have already stated that the question of suitable raw material for the production of first-class Terra-Cotta is by no means simple, and in order to solve the matter satisfactorily, some manufacturers make from the clays of various districts such a body as they consider most suitable. The London manufacturers, for instance, as well as some others, are compelled to rely entirely on clay from localities at a more or less considerable distance from the place of manufacture. Although by judicious mixing it is no doubt possible to produce a thoroughly good and sound body, yet when the finer and more important proportions of the raw material are imported from considerable distances, often at a considerable expense, there is some danger, in these days of excessive competition, of the product suffering by a too sparing use of the

most desirable constituents. I have incidentally alluded to the question of color; this is, however, a most important point in determining the value of a Terra-Cotta material for architectural purposes.

The prime coloring matter is oxide of iron, present in one form or other in all genuine clays; but these oxides are very various in their quality and condition, and produce remarkably varying results under the action of fire. Some clays will develop a rich deep red color, others a warm buff, and these again vary considerably according to the mode in which the heat is applied, or according to the amount of atmospheric oxygen admitted during the process of burning. The color qualification of each bed of clay can practically be determined only by experience, for although chemical analysis may indicate the actual quantity of iron oxide present, its effect is a matter of direct experiment. In some cases it is necessary to support the coloring properties of the clay by additional oxide; in other cases the oxide is present in too abundant degree, and has to be neutralized. The degree or tone of color most desirable for architectural purposes ranges from a warm buff to a deep red, and by the aid of recent improvements in manufacture, aided by improved chemical knowledge of a technical character, it is now possible, with a good material, to produce almost any required tone, or even any required color.

In the production of these results with any accuracy, the quality of the fuel used is an important element. A variation in the sort of fuel used often produces very perplexing results, and unless its nature is understood, may defeat the greatest care in other processes. A sulphurous coal is one of the greatest drawbacks to purity of color, and often furnishes one of the constituents for chemical combination with some of the salts evaporated by the clay, and with them form several varieties of sulphates often known as "scum," which more or less disfigures the surface of the bricks or Terra-Cotta. Possibly I may have said enough on the question of raw material to make clear some of the salient points connected with it, and without further enlarging, I will now pass on to

THE PROCESS OF MANUFACTURE.

It will at once be understood that the processes of manufacture are only next in importance to the nature and character of the raw material. In some cases very simple and elementary processes of preparation are all that are necessary to secure such results as are possible with the material, whilst in other cases a strong and costly plant is necessary to reduce the raw material under control, and produce from it satisfactory results. With the plastic and slender clays to which I have alluded, but little more is

necessary, if they are clean and free from grit, than thorough working in a pug mill, a machine composed of knives revolving in a cylinder, the effect of which is to work up the material into a homogeneous mass of the requisite degree of plasticity. In some cases, however, the clay or loam is full of stones and hard grit, which must either be crushed between heavy rollers or washed out, and both these processes are more or less in use. The hard and strong marls and fire clays, however, require more thorough treatment, and in many cases it is desirable to reduce them to the condition of fine powder as a preliminary process. In all clays, thorough weathering or exposure to the oxidizing influences of the atmosphere is most desirable, and the thorough plasticity or homogeneous quality of the clay depends largely on the thoroughness with which this is applied. Unweathered clay is much more likely to twist and warp in drying and burning than is the case with clay properly prepared.

Of late years very powerful machinery has been adapted to all the preliminary processes of preparation, by which both time and labor are saved, and certainty of result secured. After being reduced to a plastic condition by these means, the clay is all the better for remaining in a mass for a lengthened period of time, if suitably protected from incrustation. There are several methods of moulding Terra-Cotta, and some manufacturers have adapted machinery to some portion of this work; but the only really satisfactory method, although not the cheapest in all cases, is to press it into plaster moulds accurately made from plaster models. The making of the model is one of the niceties of the Terra-Cotta manufacture. Unless made to shrinkage rule in the first instance, the designs or working drawings of the architect have first to be enlarged to the requisite size, to provide for the ascertained shrinkage of the clay in drying and burning. In all first-class Terra-Cotta works the shrinkage can be determined to a very great nicety, and it is most important that it should be so if the various blocks are to work together with accuracy. The most thorough method is to prepare a plaster model exactly representing the required block, *plus* the shrinkage allowance, and if this is skillfully done, and a mould taken from it, in the way best adapted to moulding the clay and afterwards withdrawing the mould, accuracy of result is reduced almost to a certainty. It cannot be denied, however, that there is in this operation much room for bungling, and equal scope for the exercise of skill and practical knowledge and experience. Inaccurate or badly-made models and moulds are apt to twist the clay, and are by no means unknown, and hence often follow bad joints, irregular lines, twisted blocks and general bad work, only to be avoided by great care and practical skill in this department, in which good, careful and experienced workmen are not too plentiful.

When decorative or enriched modelling is required, there is further scope for intelligent and trained skill. Many enrichments are murdered in the modelling, and the most graceful designs converted into hard and lifeless monstrosities from a lack of artistic perception on the part of the modeller. Having personally devoted considerable attention to this subject, I may perhaps be permitted, in passing, to express the opinion that although the English sculptor in stone can possibly hold his own with the world, I have not yet found an English modeller in clay who can hold his own with the continental modeller of similar calibre, trained in the Italian and French methods of manipulation, either in respect to the speed, quality or spirit of his work. Possibly now that Terra-Cotta is assuming greater architectural importance in this country, this position may not be of long continuance, but the great requisite is that trained artistic perception should more intelligently guide manipulative skill.

After the clay is moulded or modelled, it has then to dry very gradually, for hurry, haste and push are fatal to true work in Terra-Cotta. Ample floor or still room is necessary, of a suitable temperature, and considerable attention is often necessary to regulate judiciously the process of drying. When sufficiently dry—and clays differ as to this condition—the final and possibly most critical process of burning follows. This process is variously performed according to the quality and nature of the clay, and according to the standard of excellence in color, exactness and durability sought to be obtained. Some Terra-Cotta will not bear more than a good red heat, whilst some requires a degree of heat sufficient to melt iron, or even steel. Much depends on the quality of the material and the color desired, and very great practical and technical skill is required to secure even an approach to perfection.

By some makers muffled kilns are adopted, in which the flame does not come in contact with the clay; some adopt down-draft kilns, and others up-draft; some use square kilns, and some round. There is, in fact, no rule but the rule of experience, based upon the nature of the materials and the appliances at command; but it is essential to good Terra-Cotta, whatever the precise mode of securing it, that it should be thoroughly well burnt. I need not say, however, that in some cases the rule of thumb and precedent is more blindly followed than is altogether desirable, and a thoroughly intelligent perception of cause and effect upon anything like scientific data is too often the exception rather than the rule; and hence it often happens that great irregularities occur in the degree of heat applied, and in the color produced. Much greater attention has of late, and is now being given to this most important subject, and indeed it is obvious that it is a critical point in determining the question of the more general application of Terra-Cotta. Badly made and carelessly burnt Terra-Cotta is simply

an architectural abomination, but assuming these conditions to be satisfactorily solved, as they may be, I will next allude to the question of

DURABILITY.

Is Terra-Cotta as durable as stone? I might reply in one sentence,—there are all qualities of stone, and all qualities of Terra-Cotta, and the inferior qualities of either are undeniably bad; but I believe I might go so far as to affirm that a thoroughly well-made, well-burnt block of Terra-Cotta is equal in constructive durability to the best stone, and probably superior. The fact that burnt clay of good quality is almost indestructible, is proved by the remains of bricks and tablets discovered by the researches of Layard and Rawlinson among the ruins of Ancient Babylon in an almost perfect state of preservation, whilst we have modern illustrations of its durability over lengthened periods in the quaint old brick structures yet to be met with in England and on the Continent, affording, under trying conditions of climate, valuable evidence of the durable nature of well-burnt clay. The great test of durability is the power of resistance to severe and sudden atmospheric changes of temperature, and to the more insidious attacks of the aciduous gases which in all large cities are more or less present in the atmosphere, and often work sad havoc with buildings on which the greatest care has been exercised in the choice of material. The question is rather, will Terra-Cotta be more durable?

The general use of architectural Terra-Cotta in this country is too recent, and the data too imperfect, to afford any very striking comparative facts on this subject, but collateral evidence I think strongly supports the presumption that well-made and well-burnt Terra-Cotta is much less impervious to the action of acids than stone. As far as chemical tests are of any value, they are certainly strongly in support of such a proposition. The foregoing statements of course do not apply to the soft silicious bricks and Terra-Cotta made of silicious clays, which, whilst they often secure a charming architectural effect, are too porous and open in their grain to withstand any severe disintegrating action. Some qualities of silicious bricks undergo a certain degree of induration by atmospheric exposure under modified conditions, but they do this by their reception of atmospheric particles, and are therefore the more readily subject to the discoloring influences of smoke, and, after exposure to the impurities in the atmosphere of large towns, very quickly become foul and choked with carbon, which, I need not say, is a serious drawback to their general use for enriched work.

The most insidious and powerful disintegrant is alternate frost and thaw, and if these operate under conditions favorable to their action, disintegration is rapid. Terra-Cotta but half burnt, like a soft stone, is sure to yield to such influences sooner or

later, but it may safely be affirmed that no material is more likely to resist them than a thoroughly plastic clay of good quality, the constituent parts of which have been brought not into *mechanical*, but into *chemical* combination, by the requisite amount of heat.

Before passing from this question of durability, on which I cannot now further enlarge, I might just mention the fact that from a constructional point of view, hard Terra-Cotta is undoubtedly equal to all architectural requirements in its power of resistance to dead weight. Not long ago I had occasion to make some experiments to ascertain what amount of dead pressure a well-burnt clay would withstand, subjected to hydraulic pressure; the average result of several tests showed a resistance more than amply sufficient for the strain to be provided against in the construction of say, a railway viaduct, in which the pressure arising from vibration and sudden imposition of weight is excessive.

COMPARATIVE COST.

A question of the utmost importance in connection with the use of Terra-Cotta is its comparative cost. This is determined partly by locality, partly by the mode of application, and also by the quality of the workmanship. In districts in which good stone is abundant and readily accessible, and to which Terra-Cotta would have to be imported from any distance, it would probably be an open question as to the comparative cost for constructive use; but this general view is subject to large modification, according to the character and extent of the structure, the proportion of repetition in the details of the design, and the quantity of mouldings and enrichments. If on the other hand, both the stone and Terra-Cotta have to be imported, the probabilities are very decidedly in favor of Terra-Cotta being the cheaper; but the general proportion of cheapness will again be determined by the conditions I have just named.

The element of cheapness in Terra-Cotta depends primarily on the extent to which each block can be repeated. Whether few blocks or many are required, the cost of making models and moulds has first to be incurred and calculated, and if it can be distributed over a large number of blocks, the cost per cubic foot is considerably reduced. If, on the other hand, only a few blocks are required of any certain form, the cost of models and moulds must be rated against them adversely. Sometimes, however, this is not so formidable a matter as would at first appear, and much depends upon the nature of the detail, and the practical way in which the work is designed and subsequently set out. It is often possible to introduce considerable variety in some directions without any appreciable increase of cost in model-making, whilst, on the other hand, a design may embrace almost the minimum of variation and yet involve

large additional cost. On such points it is very desirable that all architects should possess, as some do, a practical acquaintance with the mode of manipulation, in order to secure the best results, or as an alternative, that he should elicit some practical suggestions on the subject in elaborating the details of the design, or in making the working drawings. From what I have said you will at once see that it is difficult to name any general price for which Terra-Cotta work can be executed per cubic foot, without reference to the structure for which it is required. It varies from about \$2.00 per cubic foot to double that sum, according to circumstances and the nature of the detail. It may even run up to a very much higher figure than this, and still be considerably cheaper than stone for the same work.


The same general principles govern the comparative cost of Terra-Cotta in a modified form when applied more specifically as an enrichment; but it is less necessary to take the question of distance into consideration, and in many forms of enrichment it is possible to secure great variety of design by a judicious use of existing models. There are many instances in which this can be done in complete harmony with the artistic and architectural character of the structure, and if the designs are good ones and well modelled, a little skilled adaptation will often enable an existing model to be turned to account at very much less cost than would be involved in the special preparation of a new one.

If, however, for important structures original modelling is required, I believe it will be found that in most cases it is decidedly cheaper than stone or brick carving of a similar character.

Of course there are all degrees of modelling, as there are all degrees in carving, from very good to very bad; but, taking really first-class work in spirit and execution, as the basis of calculation, it is safe to say that Terra-Cotta will cost least, even in cases in which there is little or no repetition, whilst, if there is repetition, the difference in cost soon becomes considerable.

The use of Terra-Cotta for enrichment in the form of bands, strings, small pattern diapers and similar forms, has stimulated the production by machinery of a number of hard cast-iron-looking designs more or less geometrical or conventional, which have found some favor by reason of their low price, but many of these things cannot be considered as good artistic work, and I therefore do not venture to include them in any calculation of comparative cost; they rather rank with brick work.

I have instituted no comparison between the cost of brick work and Terra-Cotta, because brick is decidedly the cheaper form of burnt clay, and may often be judiciously used constructionally with Terra-Cotta, either according to the original conception of its use by the Italian revivalists, or in more modern forms.



ARCHITECTURAL FAIENCE.

The decorative application of Terra-Cotta Faience is so closely allied with the Terra-Cotta that it will not seem out of place if I now ask your consideration, for a few minutes, to its special features as a decorative material. The term implies a French origin, and as you are no doubt aware, was originally applied to a glazed pottery made at Fayence of somewhat stronger and heavier character than ordinary pottery. The term is still used in France in its original signification, but has gradually been applied in a more general sense to many forms of decorative glazed ware, and has been adopted as a not unsuitable and fairly descriptive term to a material that might also be called glazed Terra-Cotta, had not that term been previously adopted for a material without much character, and with no beauty either of form or color to recommend it. Under the general descriptive term of "Burmantoft's Architectural Faience" is included all forms of Faience, constructive or decorative, for exterior work, and also many special forms of the Faience now introduced and very favorably received by the profession for interior application. The material itself may be described as a ware of finer and closer grain than Terra-Cotta, and manipulated by practically the same processes and brought into the desired form by an elaboration of the methods applied to high class Terra-Cotta. To give it increased hardness and character, it is, however, fired at a much higher heat, and being composed of very pure and clean raw material, it is capable of receiving any color, either by the body of the material being mixed with various oxides requisite to produce the desired effect, or by being mixed with colored metallic glazes with a similar object. By both these methods adopted alternately, according to the object to be attained, a very hard, durable and beautiful material is produced, eminently adapted for working out in a permanent and artistic manner, both the simplest and most elaborate forms of architectural decoration.

The specimens of the material now submitted to your judgment, will, I think, bear me out in these remarks, and will render it unnecessary for me to add further description. I might, however, remark that in bringing these specimens before you, I do not claim for them any further novelty than they intrinsically possess. They illustrate, in fact, the modern application of a process as old or older than history, to modern designs and uses, and in a more complete and elaborate form. And this is all that can fairly be claimed for Burmantoft's Faience. It is, in fact, the modern form of the enamelled bricks of Babylon and Nineveh, of which we still possess recognizable and even elaborate remains, and of the Italian enamelled work in which men like Lucca del Robbia excelled many centuries ago. It differs from tiles inasmuch as it

combines constructional with decorative uses, or can be applied simply in a decorative form, and it differs from most modern forms of tiles, also in that it is manipulated on the plastic principle, and is therefore much more capable of being readily applied to any desired form and to any design without the intervention of elaborate mechanical appliances. The beauty and mellowness of the design is not lost by transference to metal, and every minute touch of the artist can be made to tell either upon a small tile or in a large block.

MODE OF APPLICATION.

The mode of its application I can safely leave in your hands, and in the hands of the profession at large, of whose ready appreciation of an effort to contribute to the range and quality of architectural material, it gives me the sincerest pleasure to make respectful recognition. I may be permitted to add but one remark. The use of color in exterior architectural design is no doubt a question of some difficulty. Many attempts have been made to secure satisfactory results on that line, and there have been many failures. For thoroughly harmonious effects it unquestionably requires the eye and skill of a thoroughly competent artist and some practical experience of the material to be used. In England we are probably not prepared by our atmospheric or natural surroundings for the wealth of color so charming and harmonious to the eye under brighter skies, but no one not a hypochondriac can with any propriety aver that we are not open to very considerable improvement in this respect, or be unready to welcome the judicious and tasteful use of such materials as improved methods of manufacture and increased scientific skill place at the disposal of the architect and builder.

GENERAL OBJECTIONS AND REMARKS.

On the general question of the application of Terra-Cotta, may I now be permitted to make a few practical remarks?

I noticed that your esteemed president not long ago made some observations in which Terra-Cotta was contrasted not very favorably with the good qualities of some other materials, and there can be no doubt that in these remarks he has spoken from extensive practical experience, and yet I venture to say that if he would add yet further to his experience, taking due precaution in the matter, he would require no arguments to convince him that the qualities he ascribes to Terra-Cotta do not necessarily pertain to the material, and are characteristic only of a bad form of it. No doubt there are unfortunately notable instances of bad Terra-Cotta, as there are of bad materials of almost every description, but there are also many instances exactly the reverse. This much can be said for Terra-Cotta, that every year increases the knowl-



edge, skill, and appliances brought to bear in its production; and as trained and skilled workmanship is brought to bear with improved processes, the quality of the work must improve in the respects in which I am bound to say it has been, and is still sometimes very deficient. As a material it has too often been resorted to by the architect for its supposed cheapness, and too often it has not been the best make by the best maker, but the cheapest make by the lowest priced maker that has been adopted. By this standard Terra-Cotta work has been judged and found guilty, whereas there is no material in which there is greater margin for skill and superiority of treatment, or for inefficiency and failure. I hesitate to say what I know of the miserable shifts by which Terra-Cotta is sometimes turned out to meet the demand for the "lowest possible price," as the alternative of "the greatest possible excellence," and there is little wonder that such Terra-Cotta is unsatisfactory.

Another objection to the use of Terra-Cotta, and one in which I feel there has been and is still some force, is that it is slow of production. There is no doubt also, that it does take more time than some forms of material for its satisfactory production, and there is no doubt also that its extensive use in a structure has sometimes caused a somewhat slower erection than has been desirable either in the interests of the builder or the owner. There is no doubt also that in such an event the Terra-Cotta manufacturer gets the full benefit of any irritation caused by the delay; nor will I say he is always wholly innocent, but the remedy for such a condition of things is often very obvious. It is often traceable to the supply being intrusted to a producer with an insufficient plant, and at a price that will never enable him to pay for any addition to it. He is no doubt to blame for taking more work than he can execute, but perhaps he is slack at the time and sanguine, and does his best; but if he is not in a position to start fair with his work at the first, woe be to him if he has a heavy job on hand.

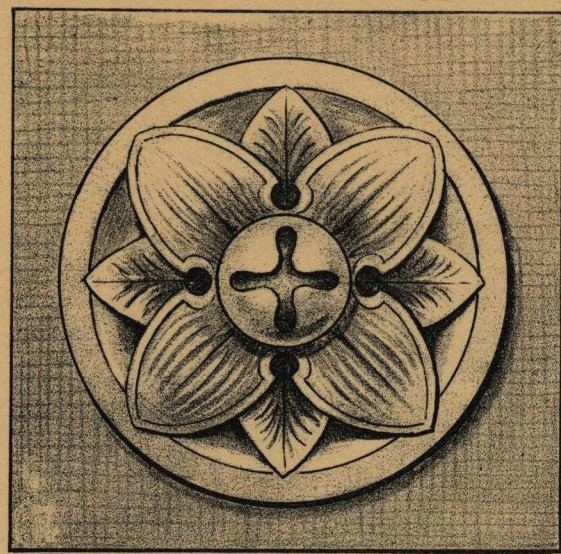
The only satisfactory method in Terra-Cotta work is to anticipate as far as possible the commencement and progress of the structure, and this can only be done in the first instance by the architect making the Terra-Cotta the subject of special estimate, as far as practicable, ahead of the general work. This is now indeed almost the general rule, and it has many advantages. It brings the architect into direct contact with the producers, and they are in better position to understand and follow his special requirements. The margin for variation in the general estimate is reduced, and the builder at once knows the amount he has to conclude for items which are often a source of perplexity, and with respect to which there are sometimes such wide differences of price as possibly to prejudice one way or the other the general estimate. The delay in getting out working drawings is also not unfrequently a source of hindrance, and if an

architect has failed to realize the necessity of being well ahead with them, it is much less easy for a Terra-Cotta producer to arrange and set out his work, in which more than any other material, it is essential, in order to work to advantage, to see the way through from beginning to end as far as possible from the first step.

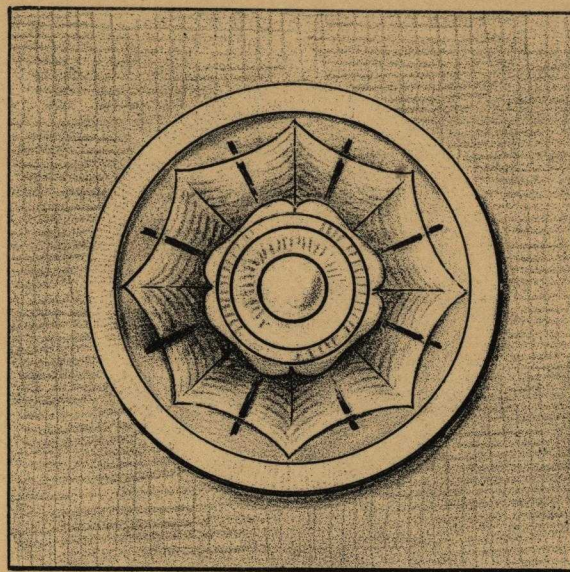
It has also happened that difficulties have arisen in carrying out working designs. Comparatively few architects' draughtsmen have had very extensive experience in getting out Terra-Cotta working drawings; and although of course principles of construction apply in all cases, yet Terra-Cotta cannot be treated altogether as stone; the form and size of blocks, the bond, the key, the joints, the mouldings, require some special consideration if the work is to be carried out to the best advantage. It is not an unknown thing for a producer to struggle with a badly conceived working drawing, and so cause serious delay and inconvenience, instead of at once pointing out the practical difficulty and suggesting an efficient remedy which might be adopted without prejudice to the constructional lines of the design, yet I venture to believe there are few architects who would not at once recognize and adopt any really intelligent suggestion thus offered when clear from any ulterior object. Nor will I say that the Terra-Cotta producer has always succeeded in getting the best talent necessary for his work; it is a work to which comparatively few men have been actually trained for its successful management, and many good qualities are essential. To carry out any important work in Terra-Cotta there must be sufficient skill to read (and correct if need be in relation to other parts) any working drawings. In not a few cases, it is the doubtful privilege of the Terra-Cotta manufacturer to make the working drawings. The thorough practical training of a mason, and the constructive skill of a first-class draughtsman is desirable. There must be practical knowledge of the material and of the best mode of treatment; sound judgment as to what can and cannot be successfully done; perception sufficiently acute to take in the idea of the architect on any novel point of treatment; artistic taste sufficiently trained to insure thoroughly good modelling of all enriched or decorative parts, and sufficient science and practical skill to secure the most perfect system of burning adapted to the particular material used. It is not surprising that a producer should sometimes break down on some of these points, in the absence of men specially and technically trained. I am, however, glad to believe that on these points considerable progress is now being made, and should the use of Terra-Cotta become still more general, it will be far more easy for producers to meet enlarged demands than it has been in the past, when, unfortunately for themselves, and sometimes for their clients, their attempts to meet extraordinary demands have not in a few instances resulted in spasmodic effort and corresponding disappointment.

TILES.

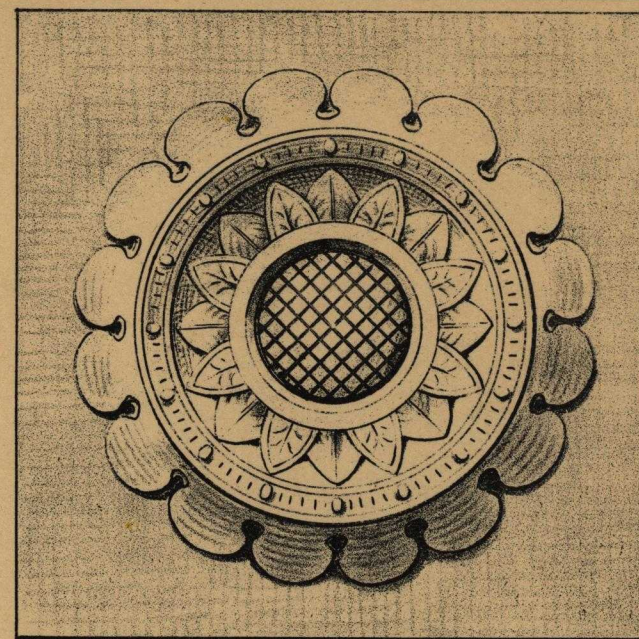
PLATE N^o 1.



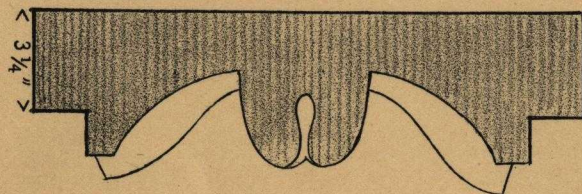
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N° 14.



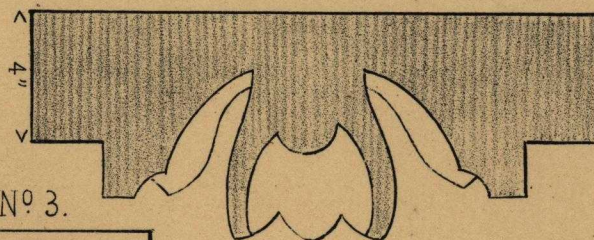
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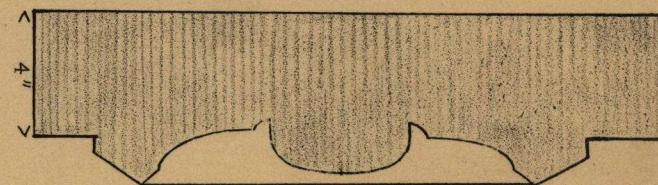
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N° 3.



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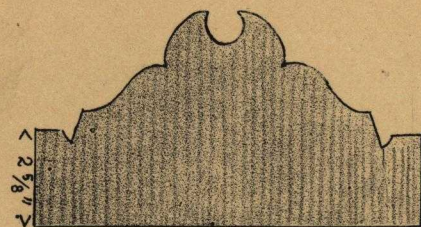


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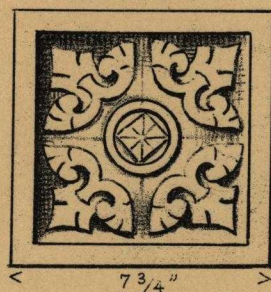
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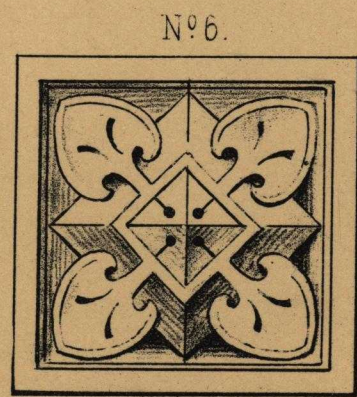
BALTIMORE MD



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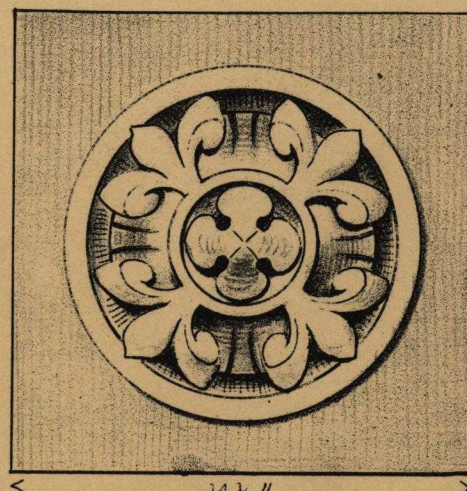


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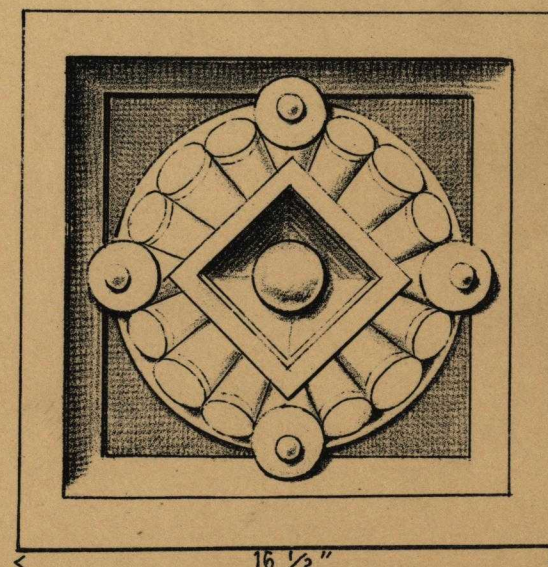


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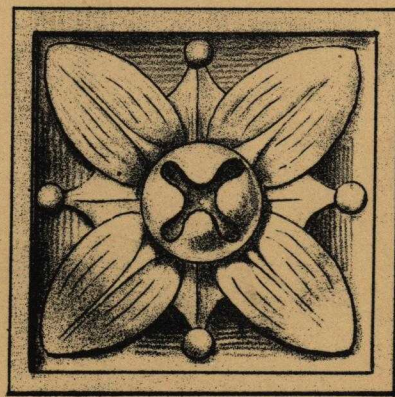
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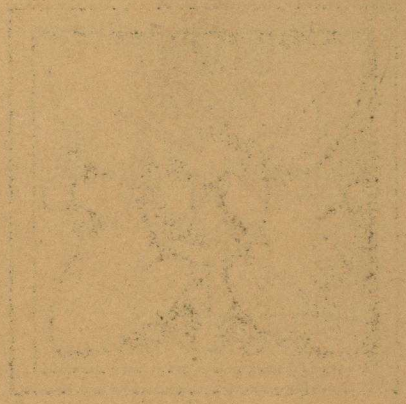
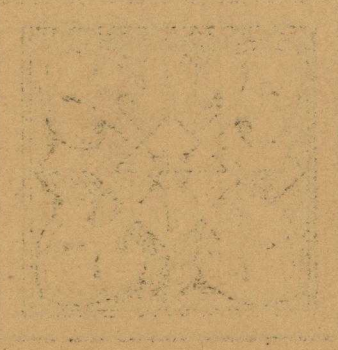
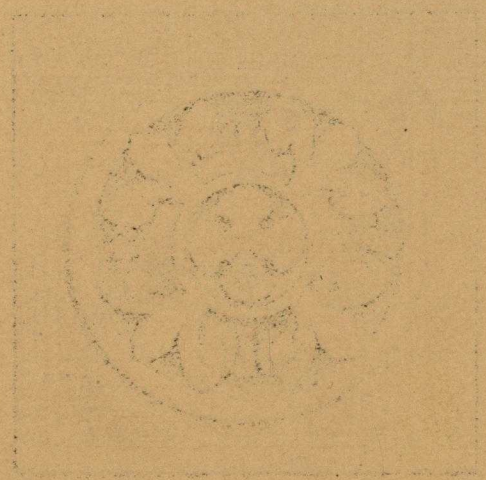
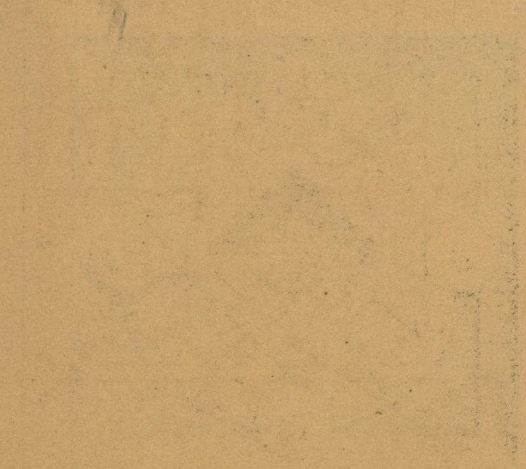
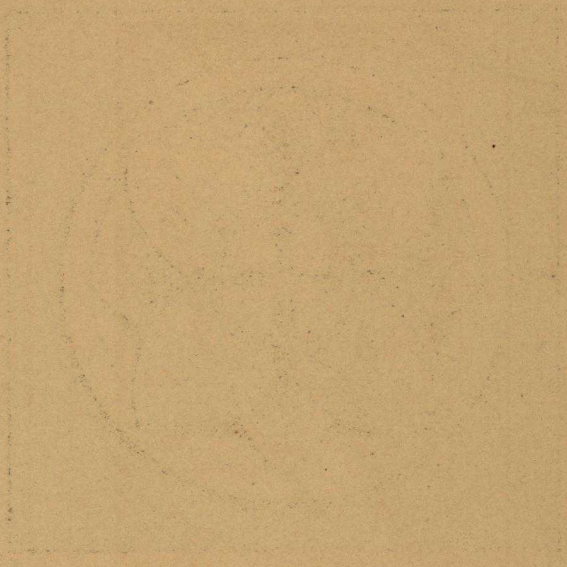
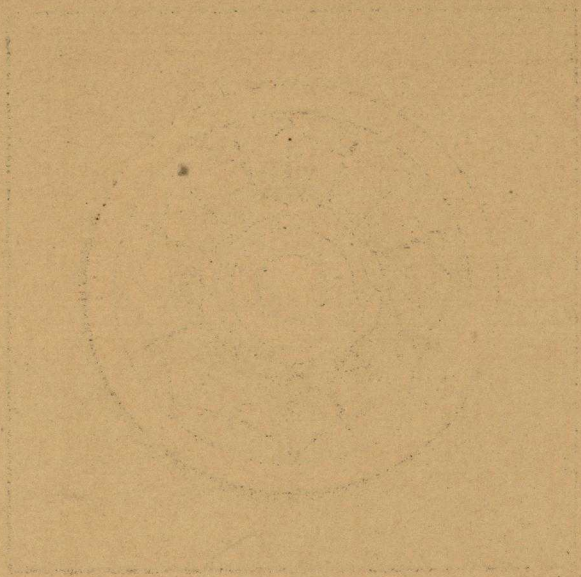
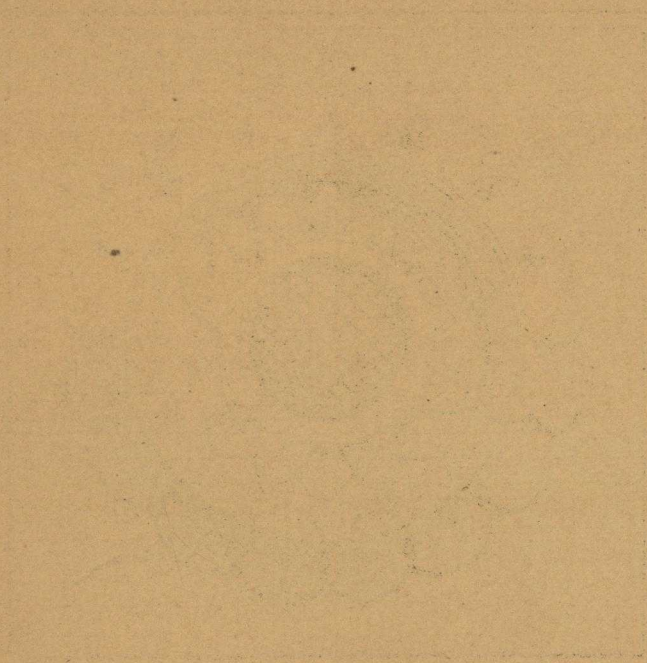
14 1/2"



16 1/2"

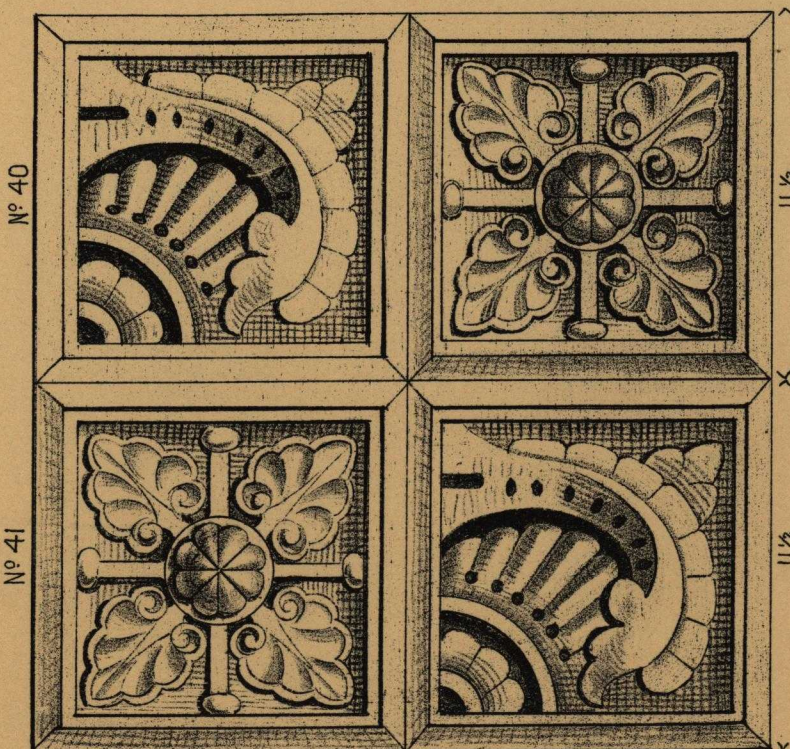
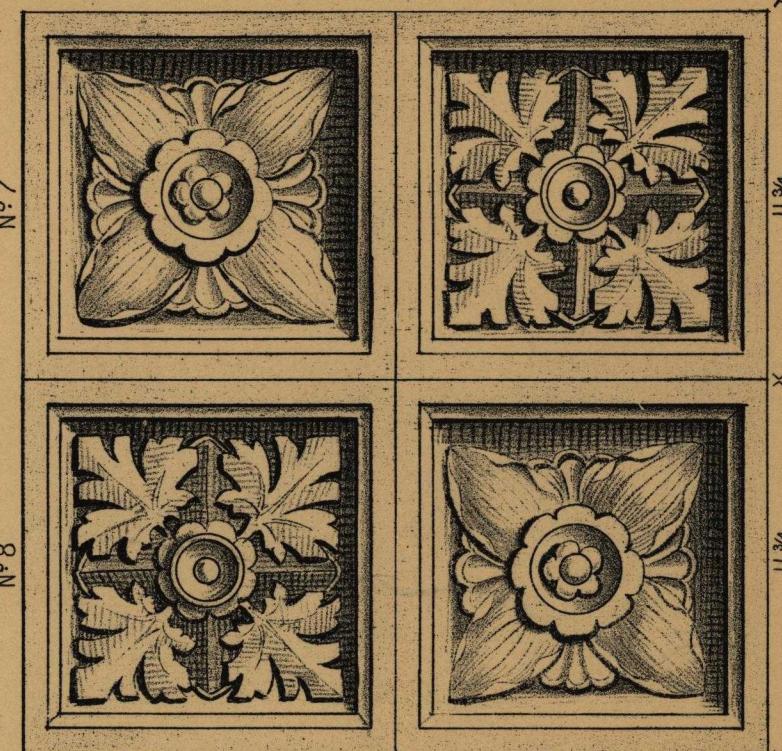
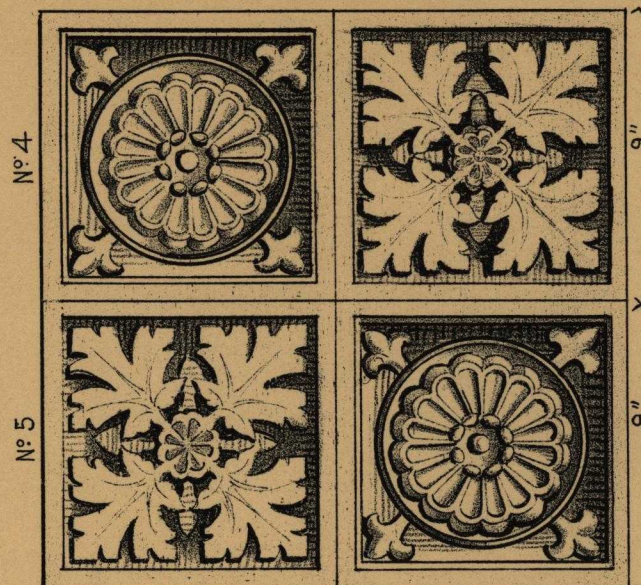
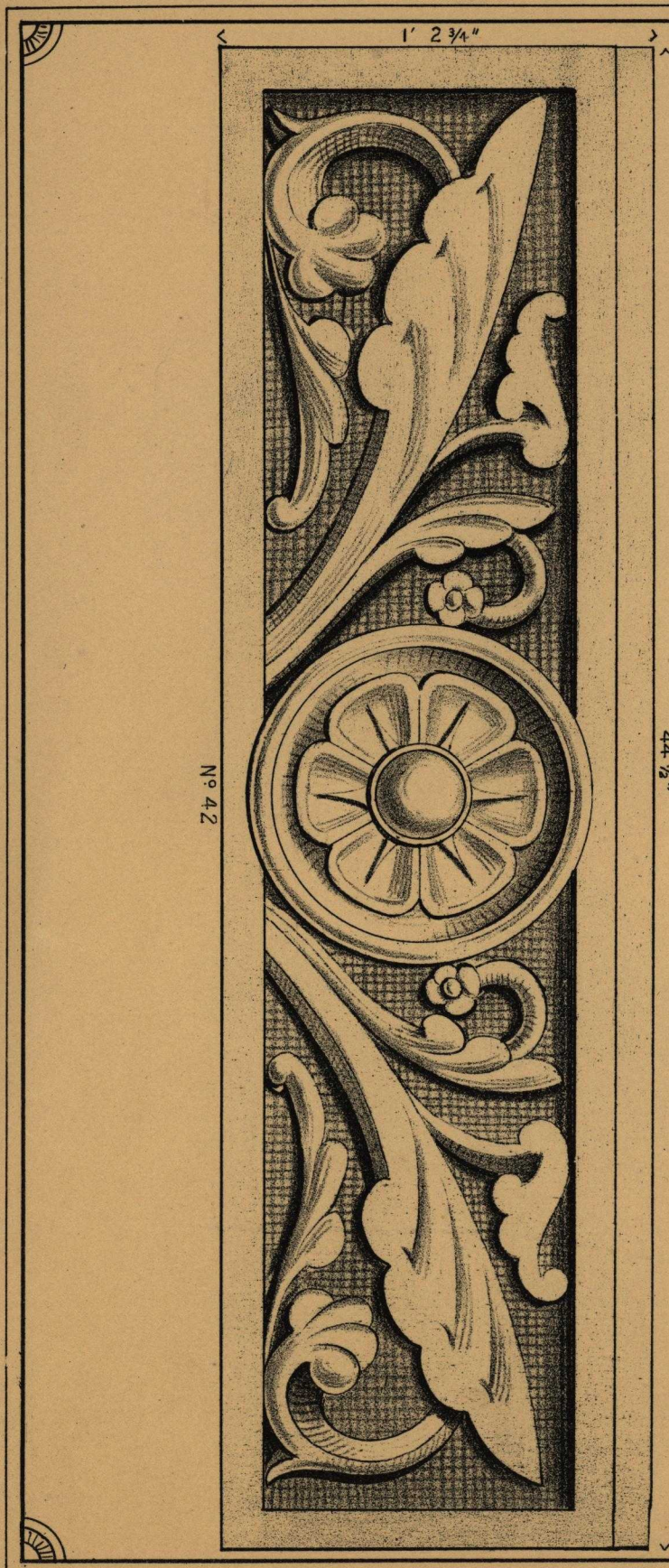


12" x 12"

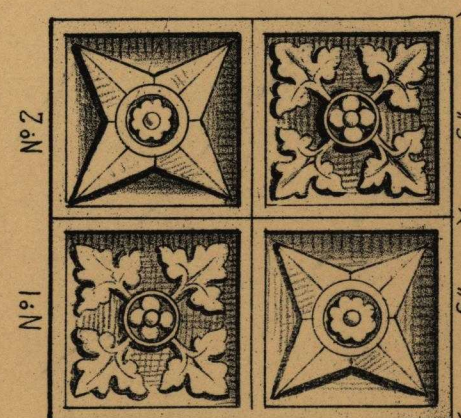


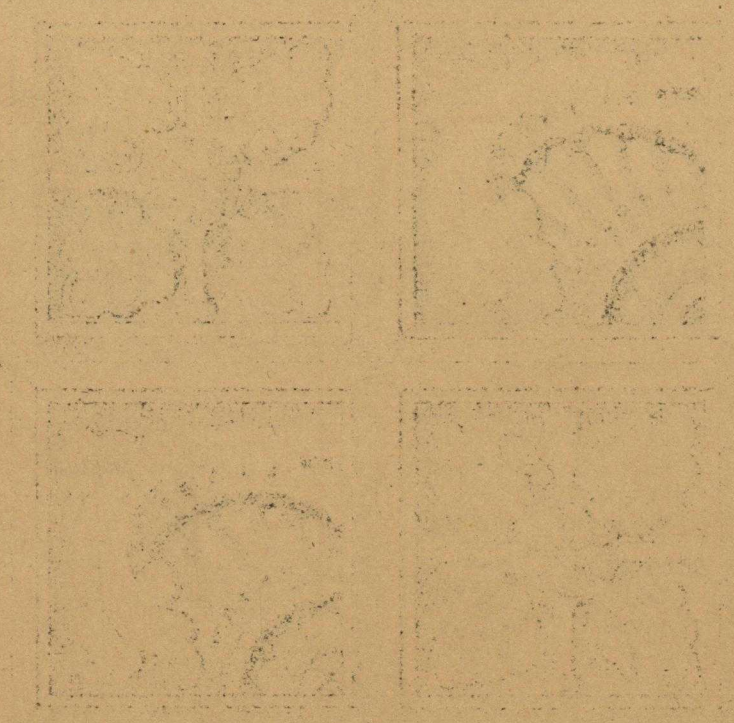
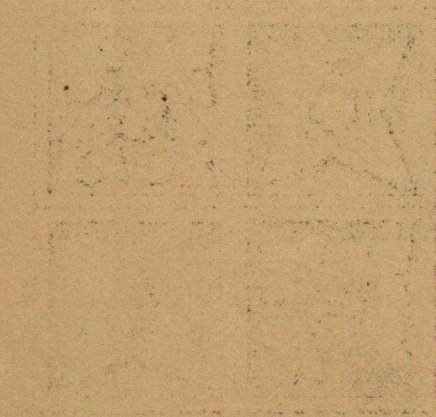
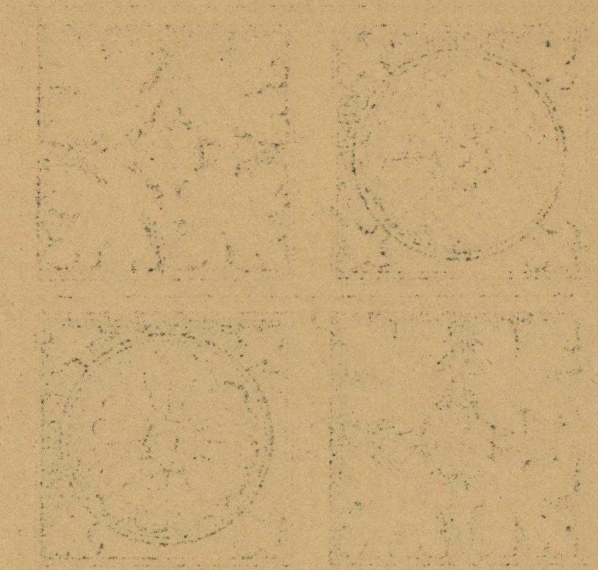
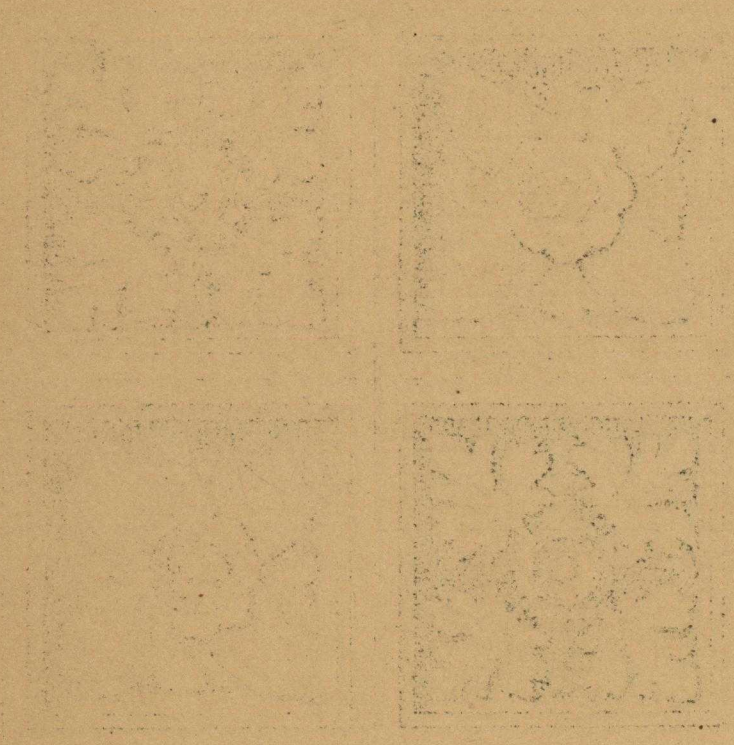
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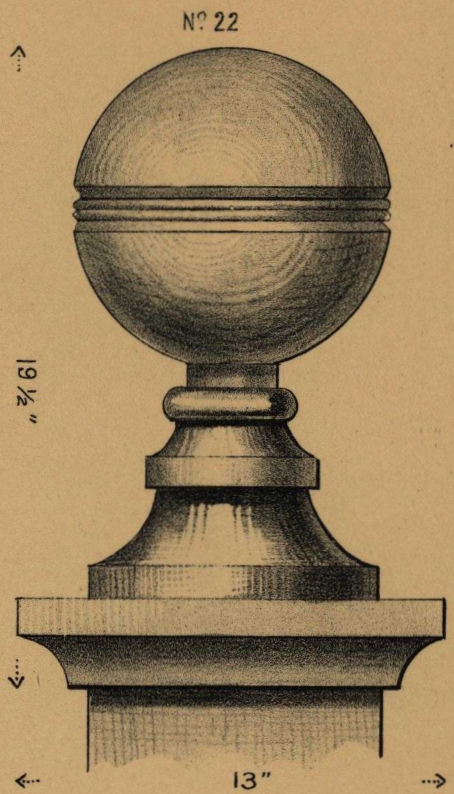
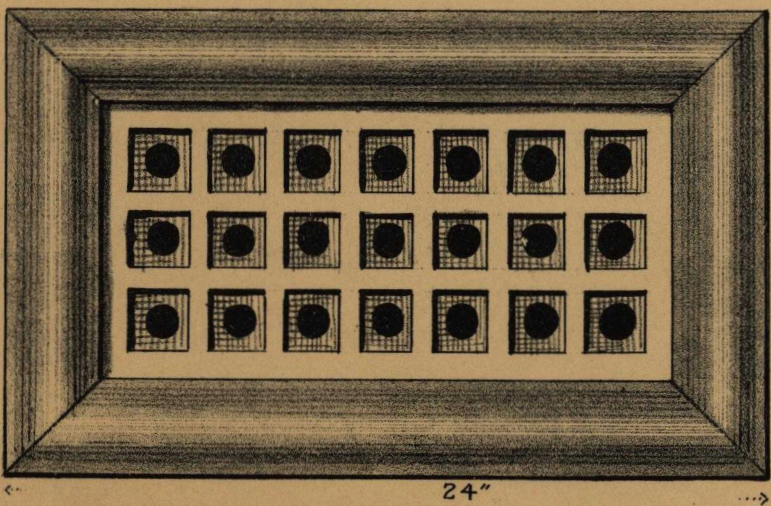
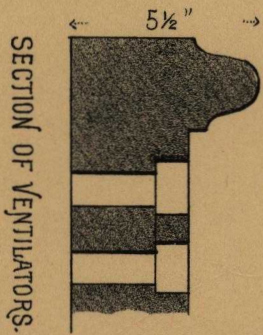
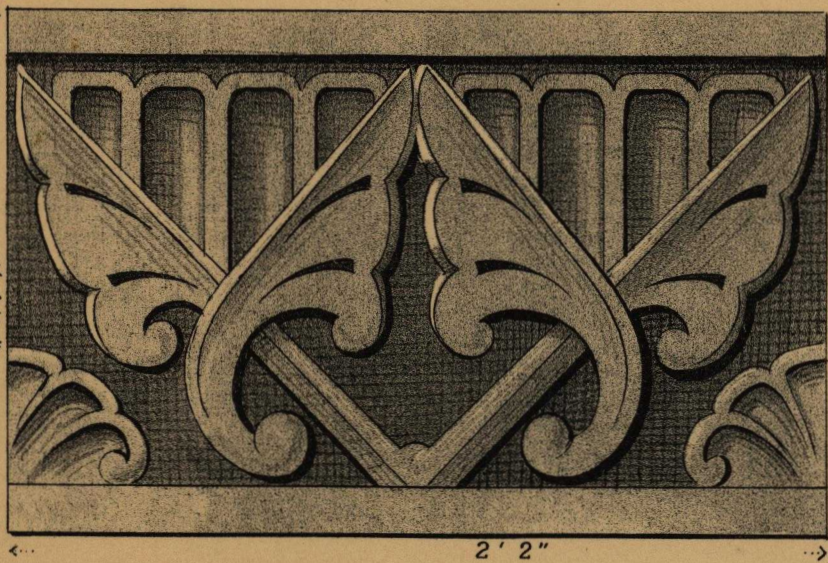
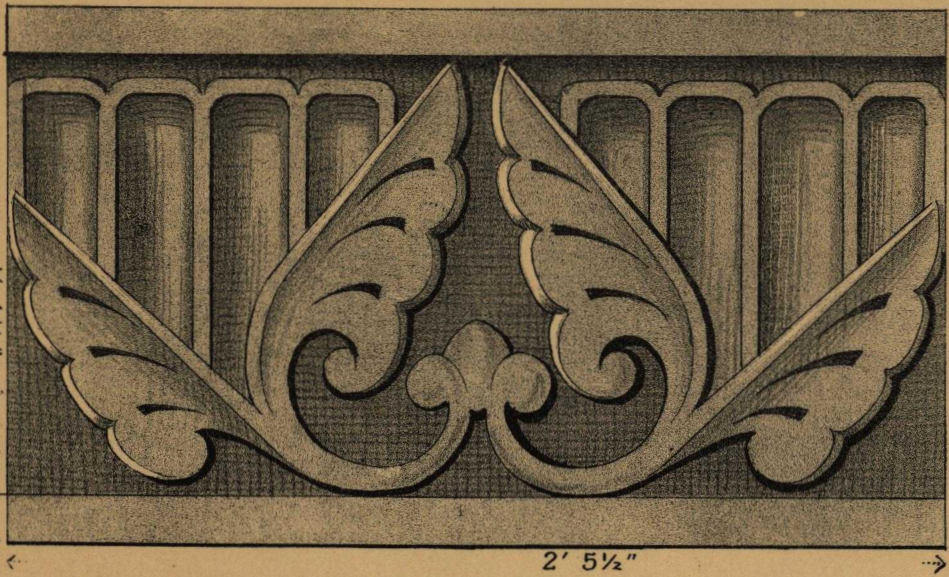
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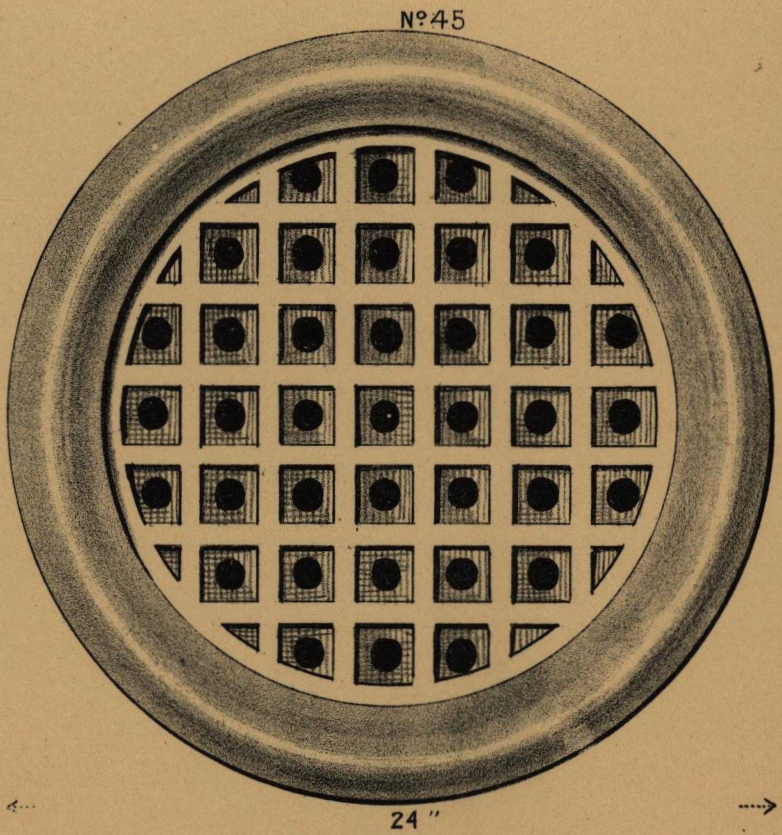
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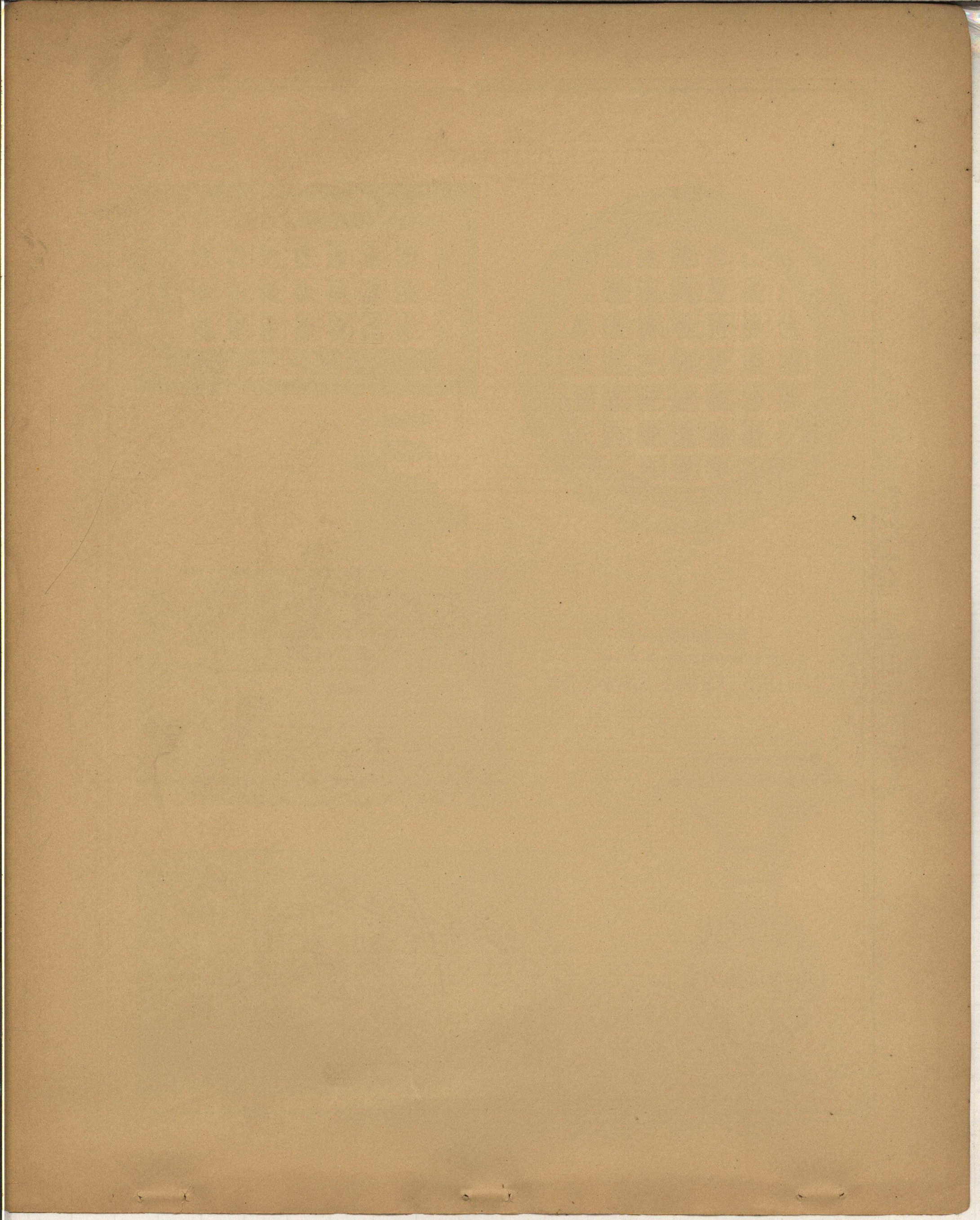


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PANELS, FINIAL AND VENTILATORS.

PLATE No. 3.

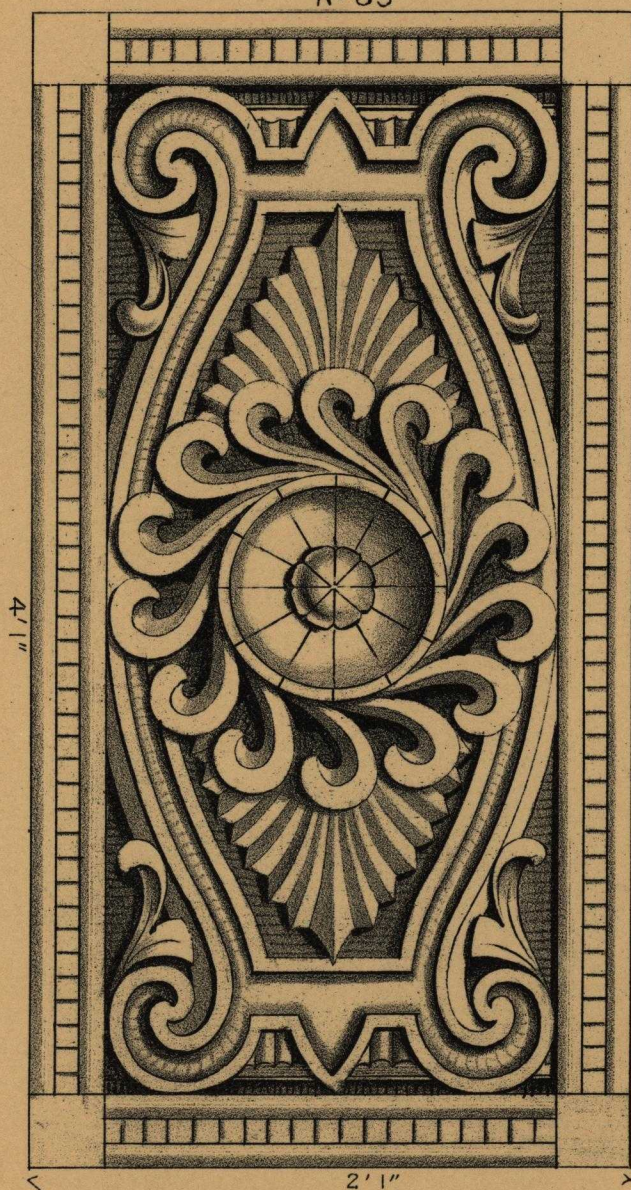


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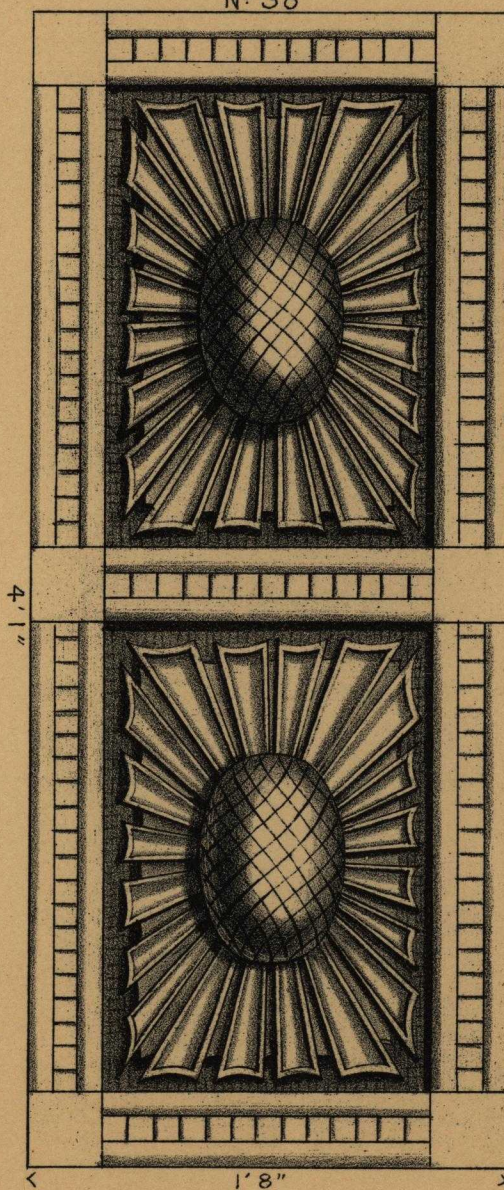
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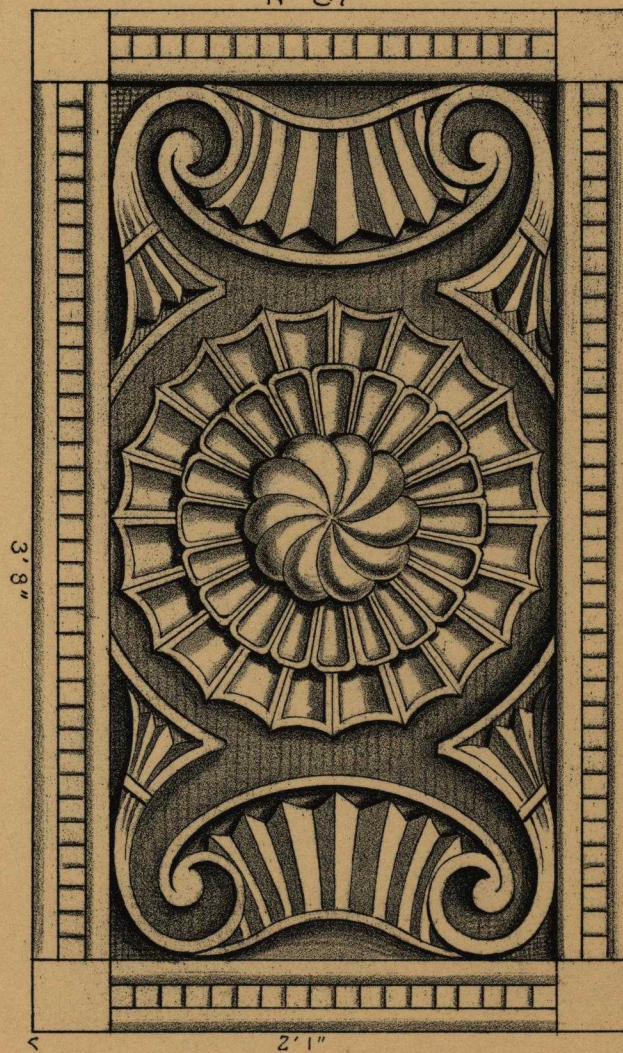
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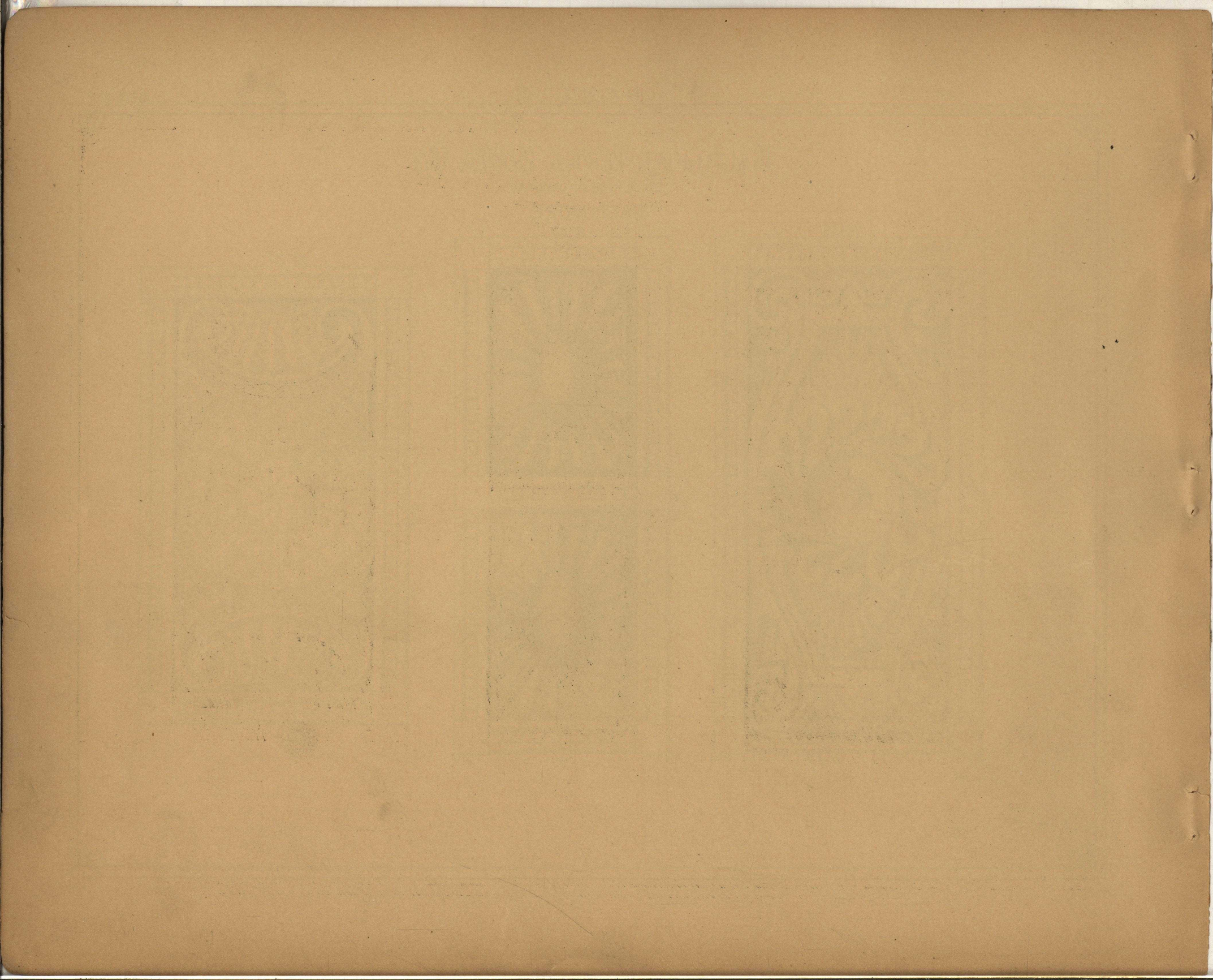


Nº 38



Nº 37





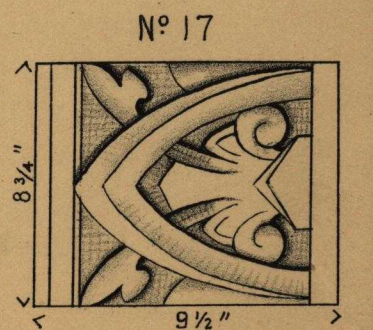
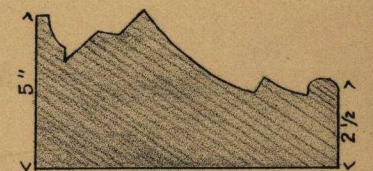
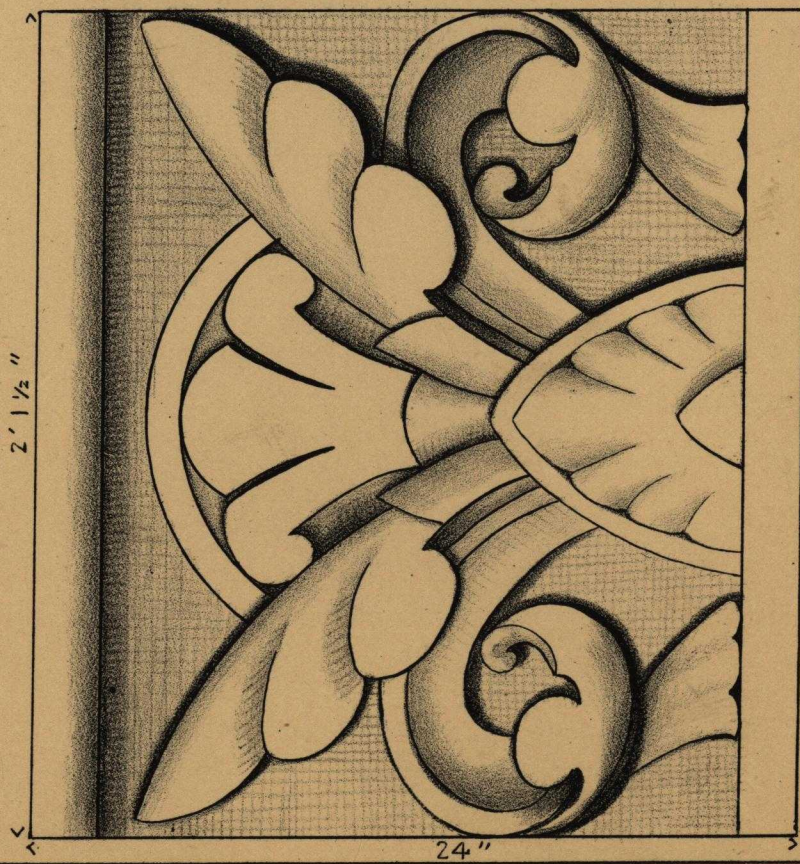
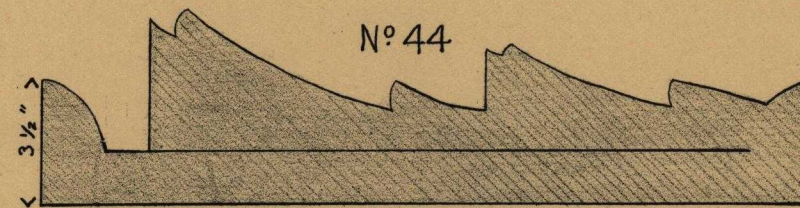
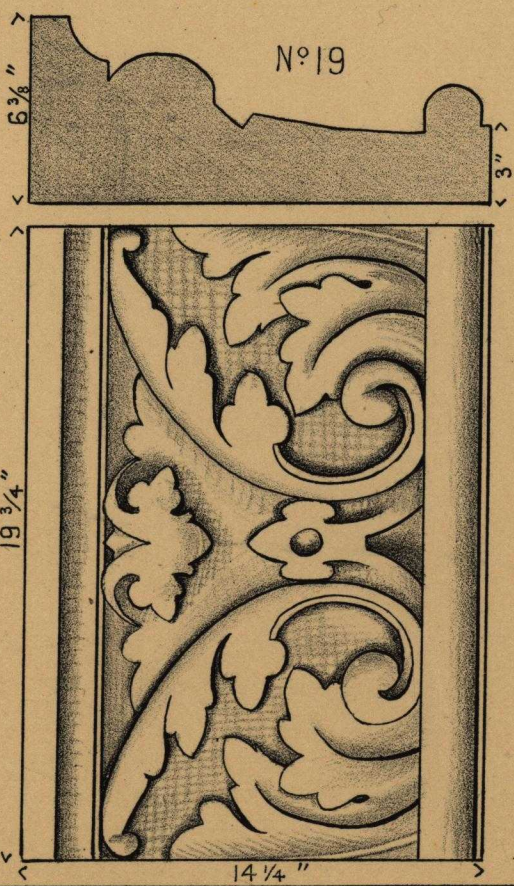
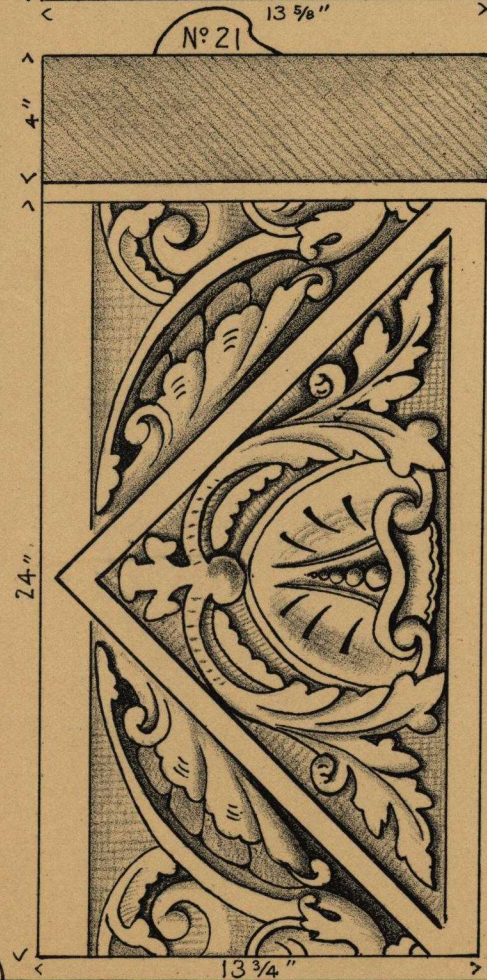
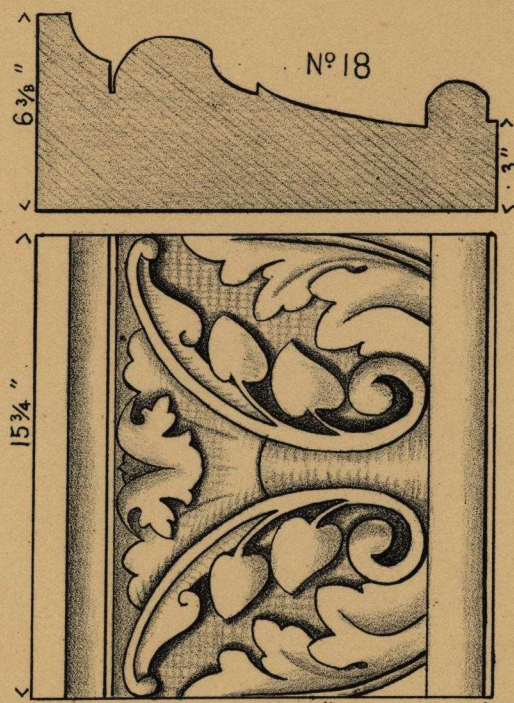
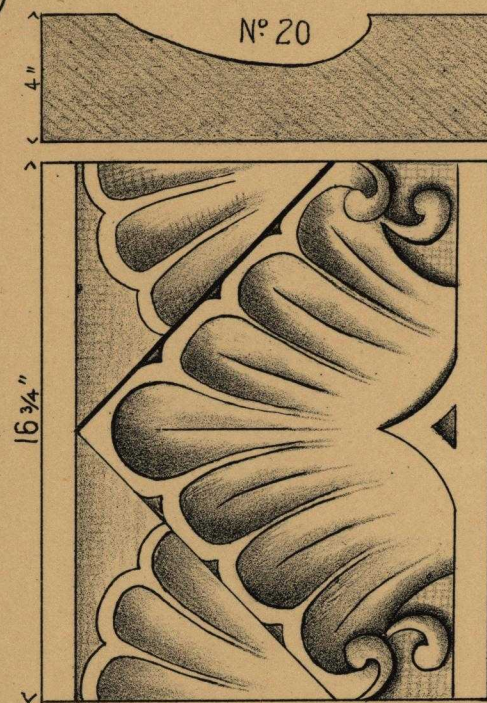
STRING COURSES.

PLATE N° 5

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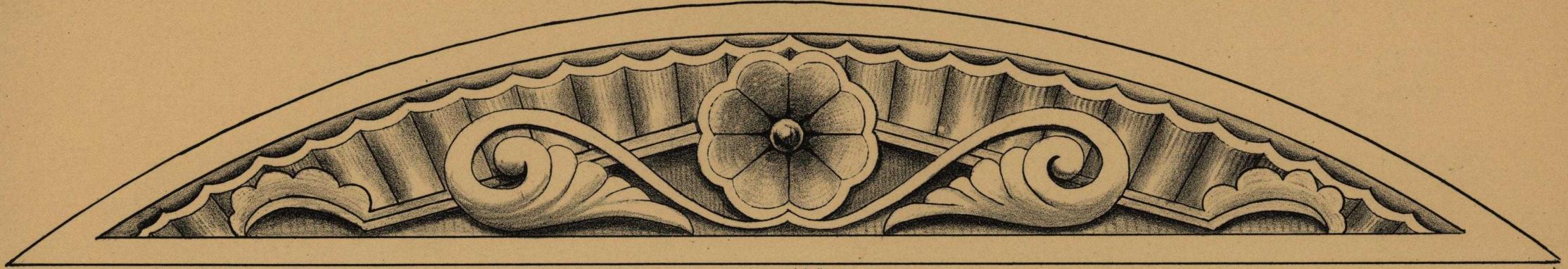
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PEDIMENT, PANELS AND IMPOST.

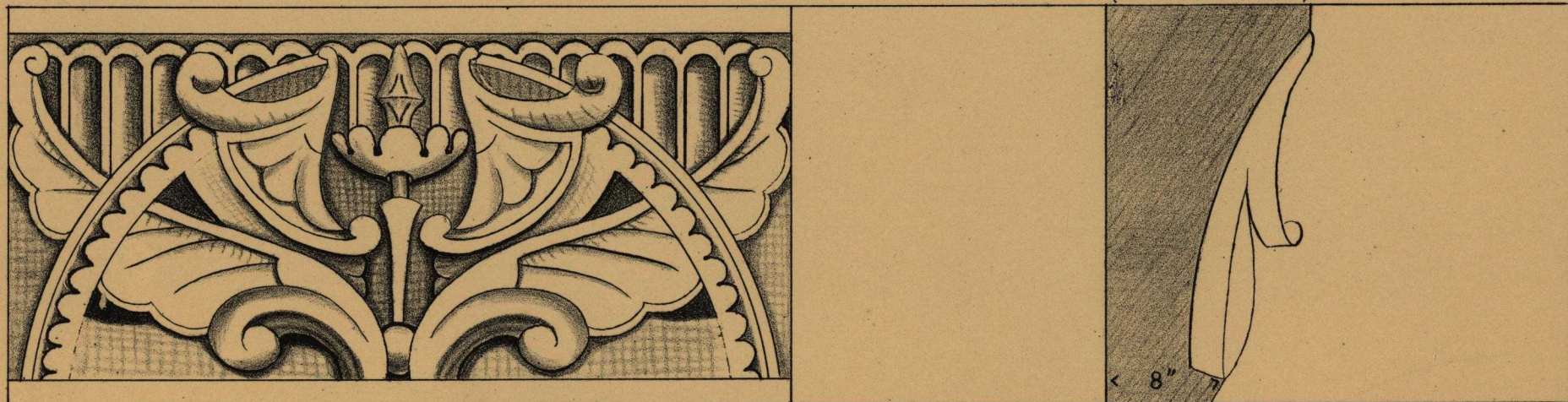
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N° 28



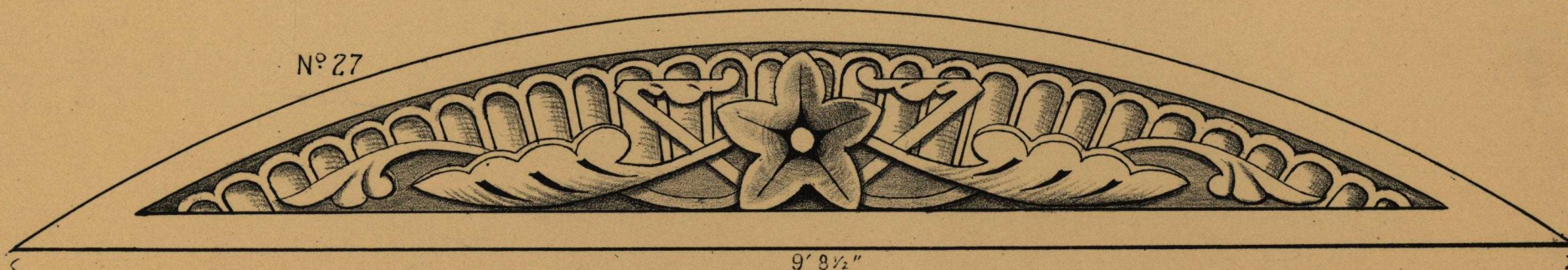
11' 7"

N° 29



9' 8"

N° 27



9' 8 1/2"

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BALTIMORE.

PEDIMENT AND SQUARE PANELS.

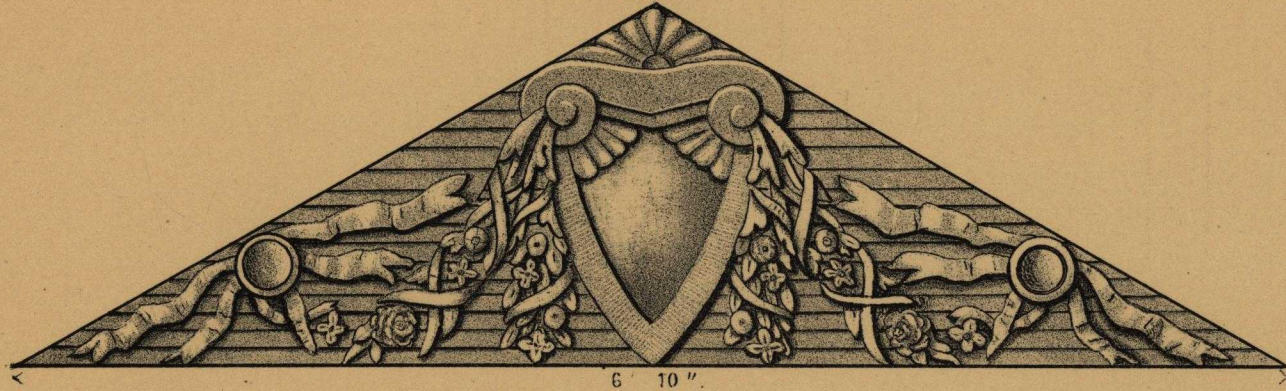
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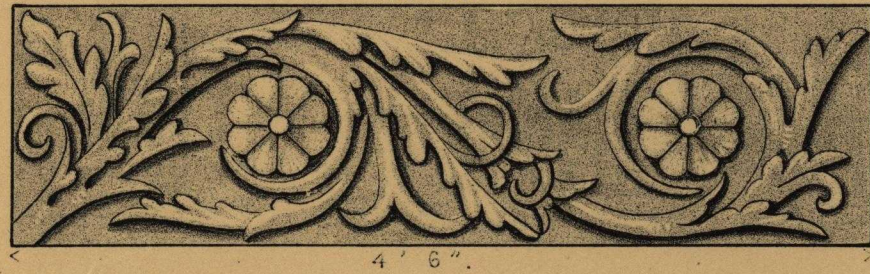
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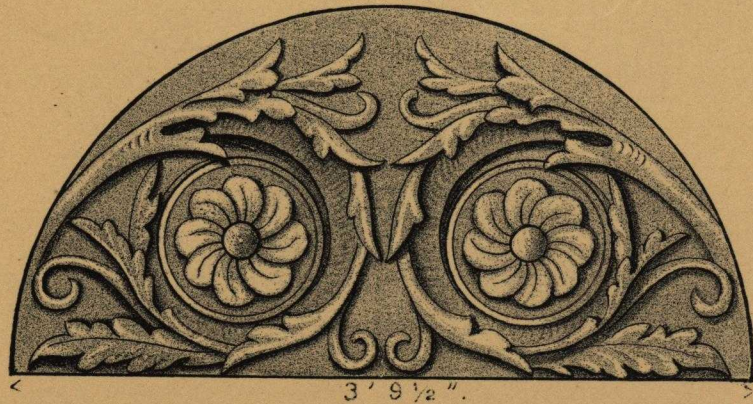
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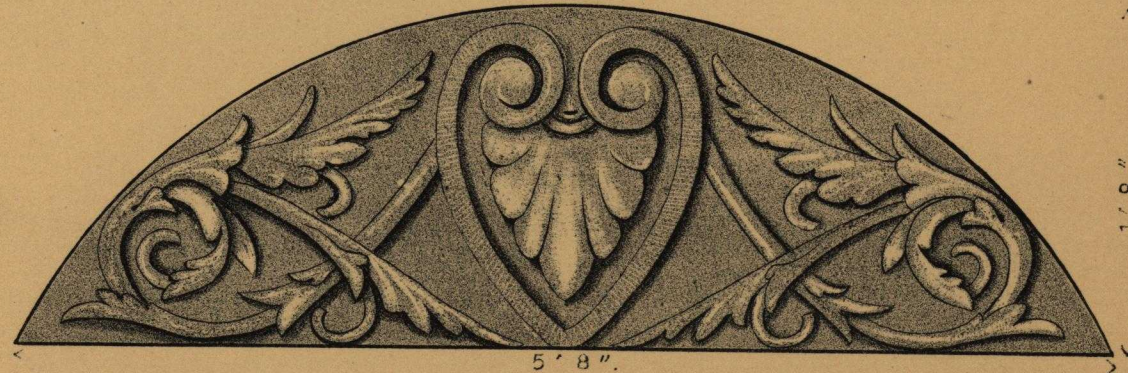
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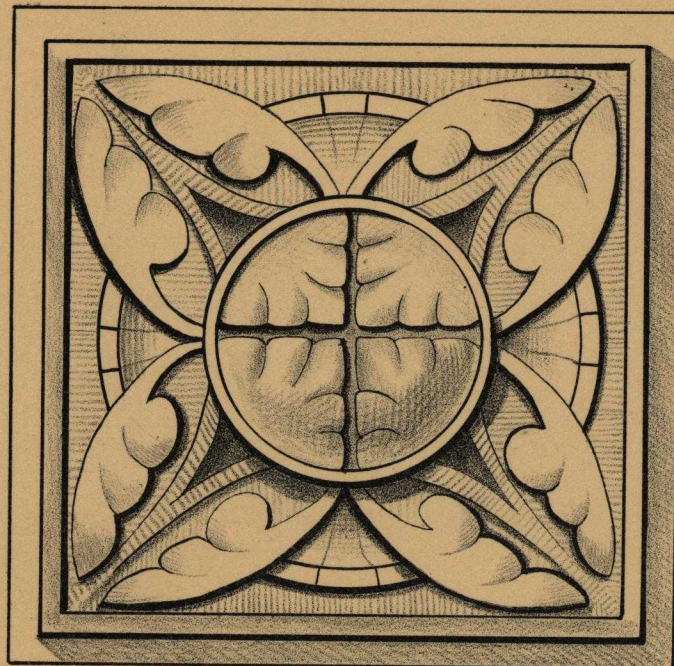
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TILES AND STRING COURSE.

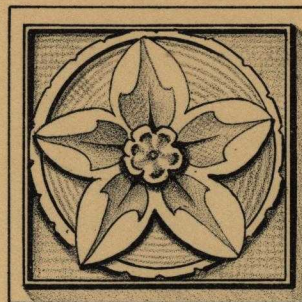
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Nº 53.



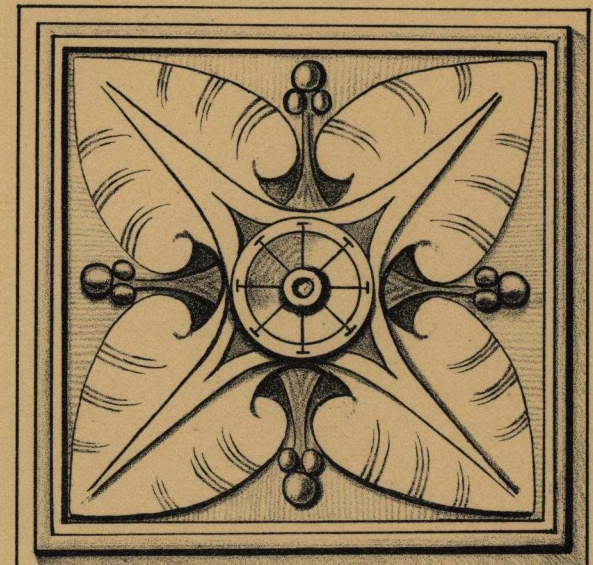
21 1/4"

Nº 50.



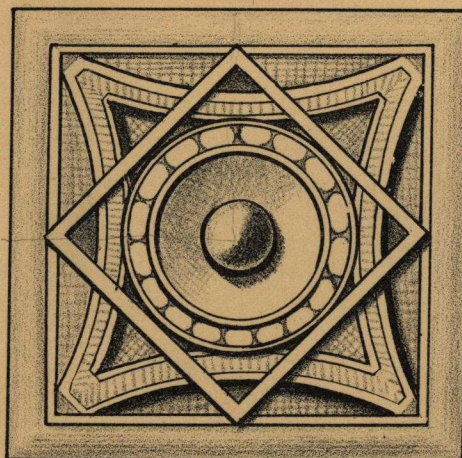
9 3/8"

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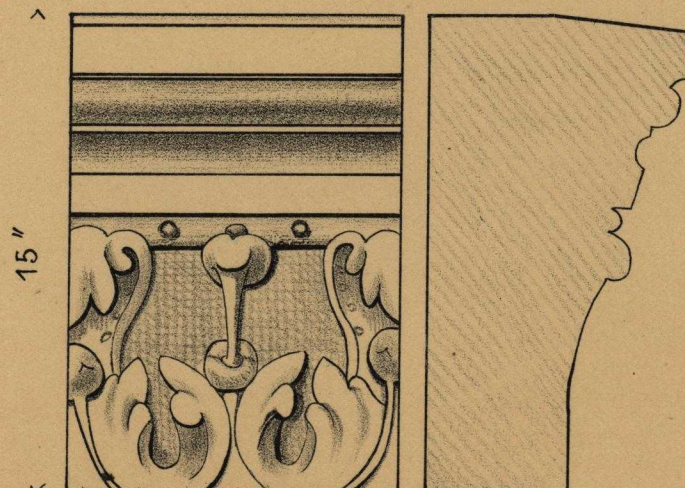
18 3/4"

Nº 51.



14 1/4"

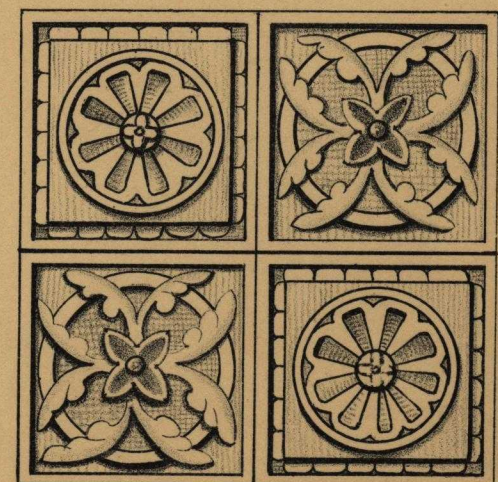
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10"

Nº 49.

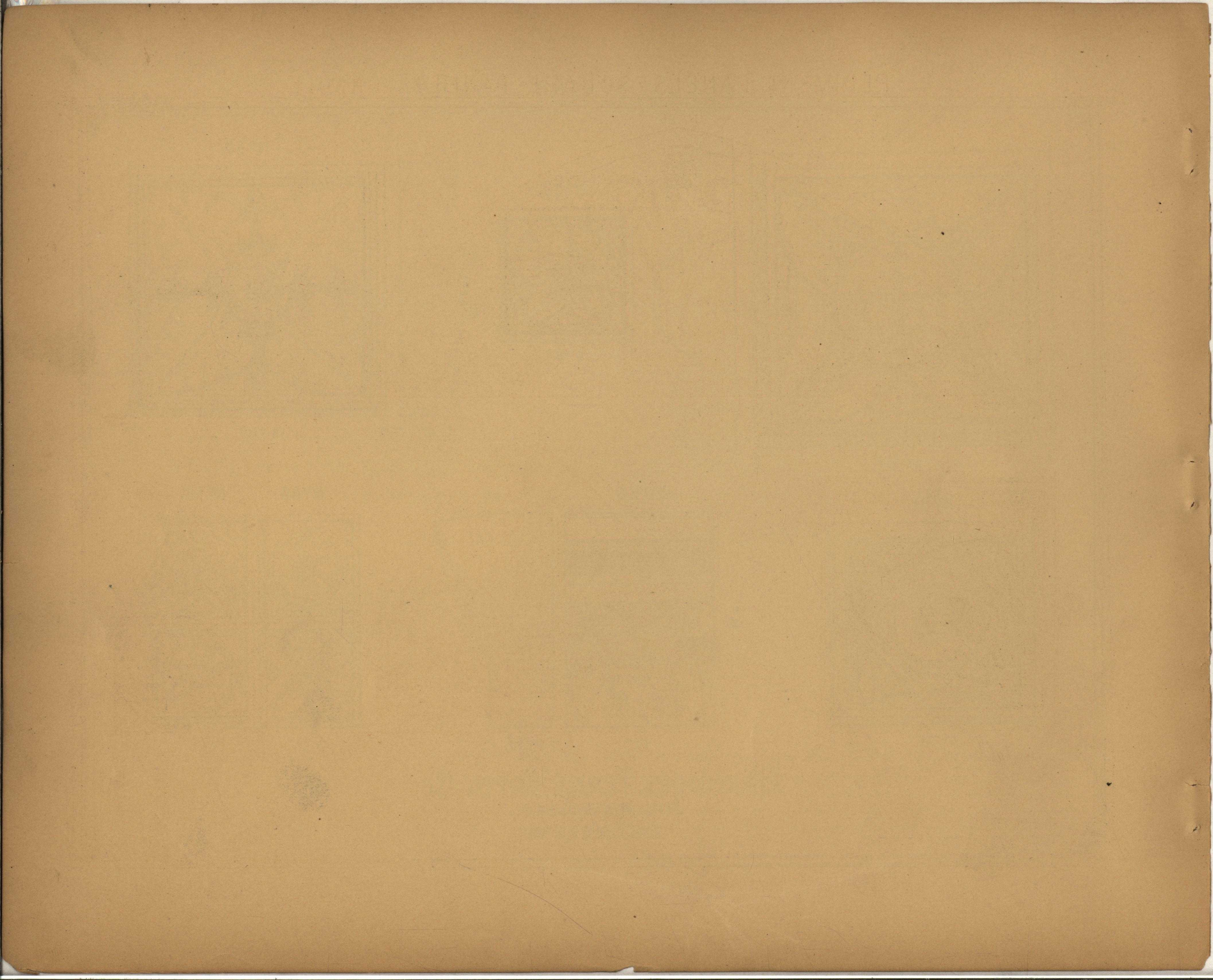
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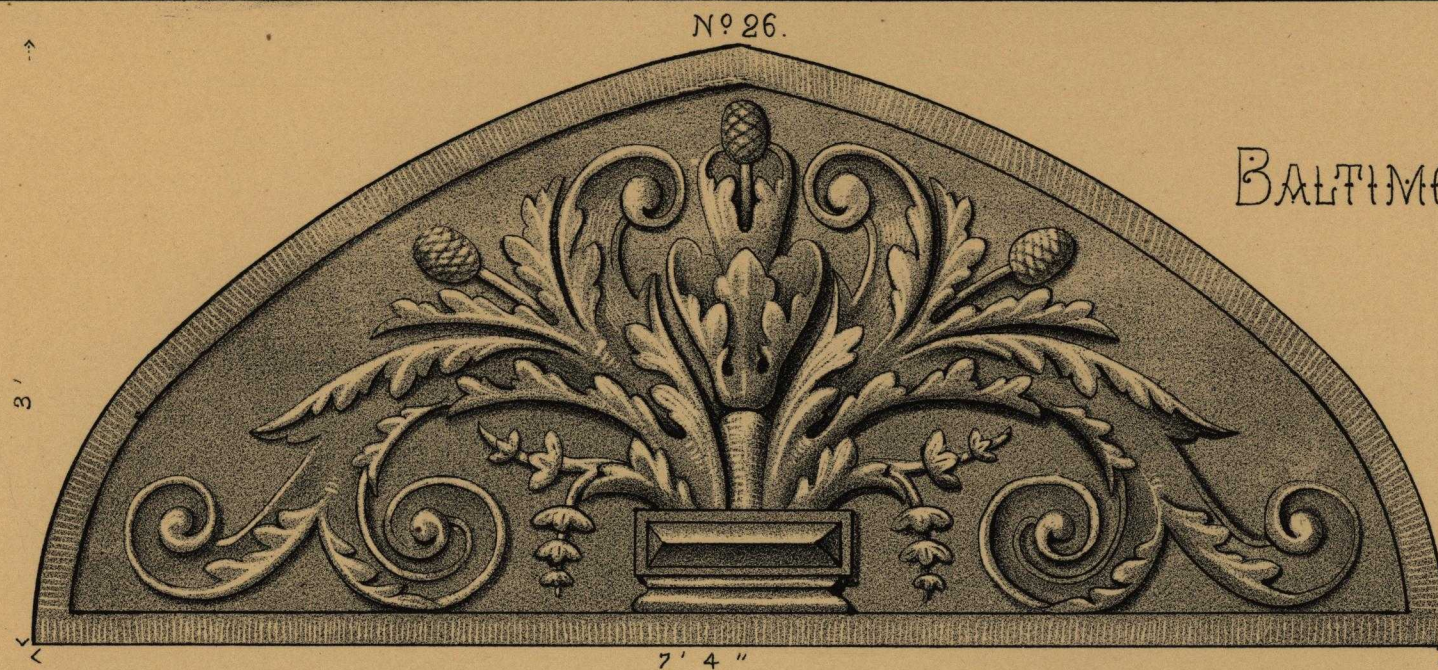
7 1/2"

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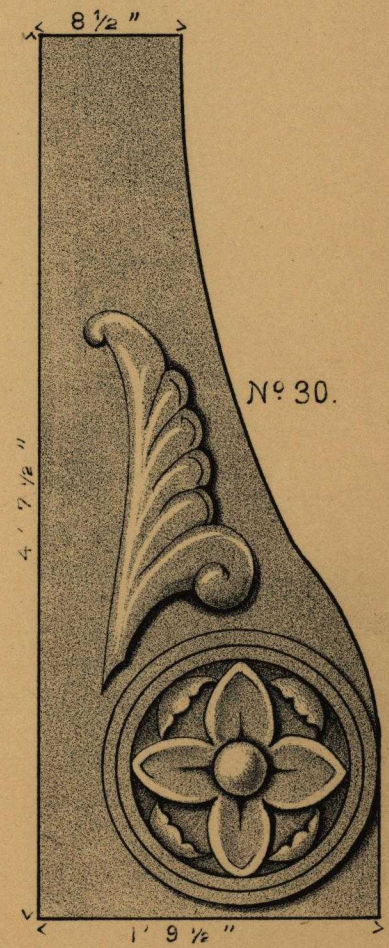
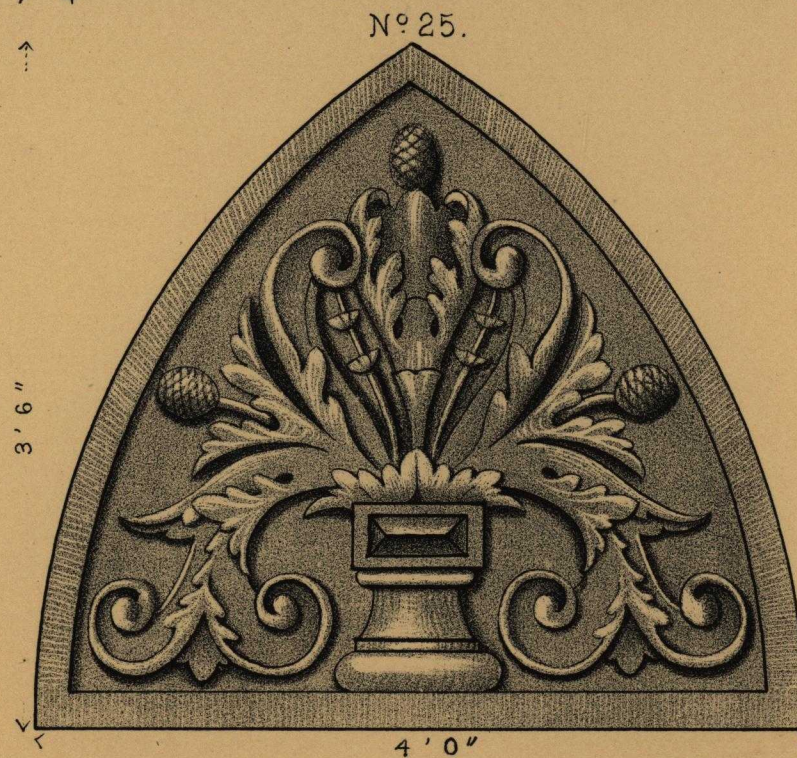


PEDIMENT PANELS, SQUARE PANEL & CONSOLE.

PLATE Nº 9.



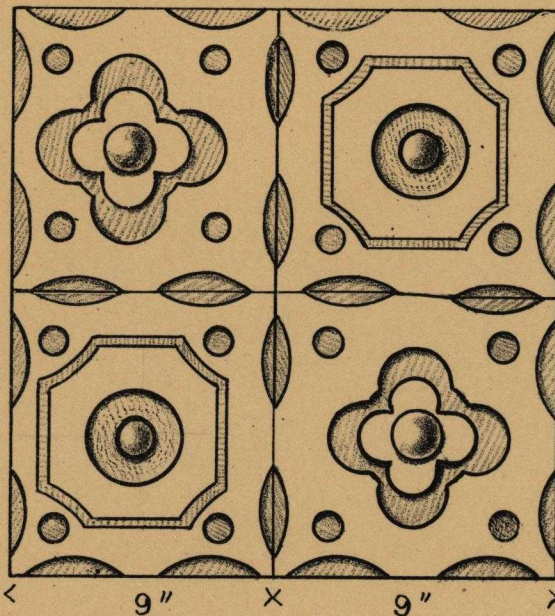
BALTIMORE TERRA COTTA CO.
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BALTIMORE.



TILES AND PANELS.

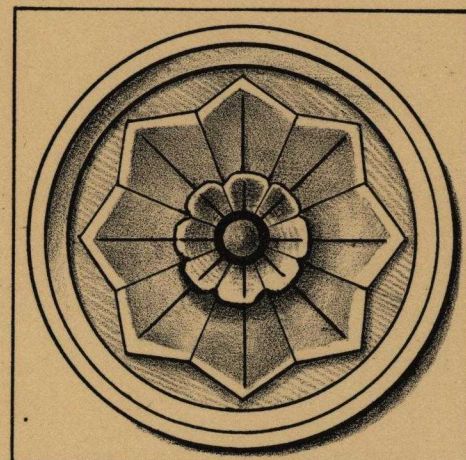
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No 55.



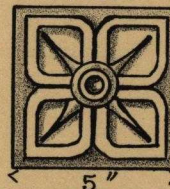
No 56.

No 93.



14 1/2"

No 57.

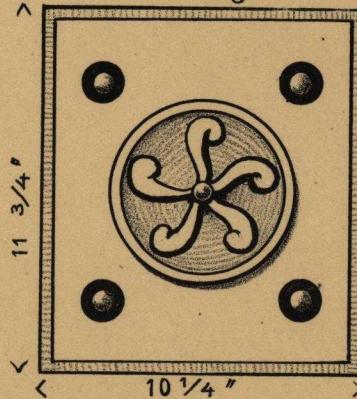


5"

4"

2 1/4"

No 58.

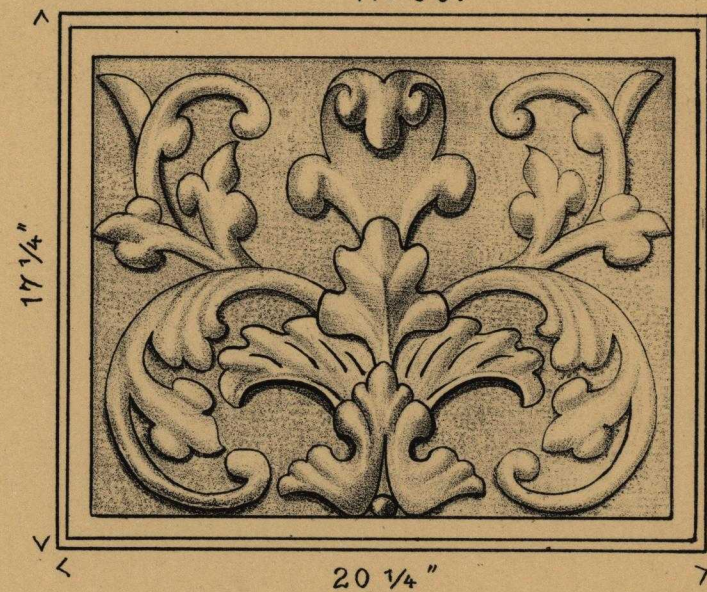


11 3/4"

10 1/4"

4"

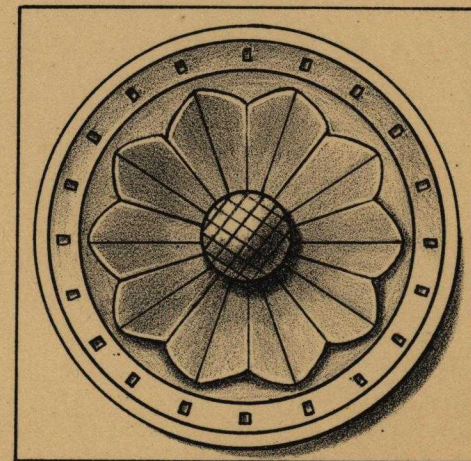
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17 1/4"

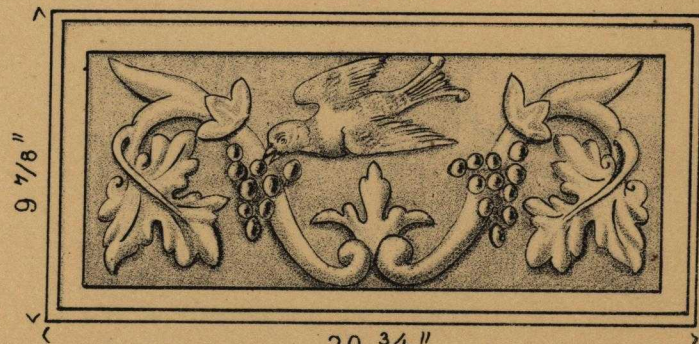
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No 89.



12 1/2"

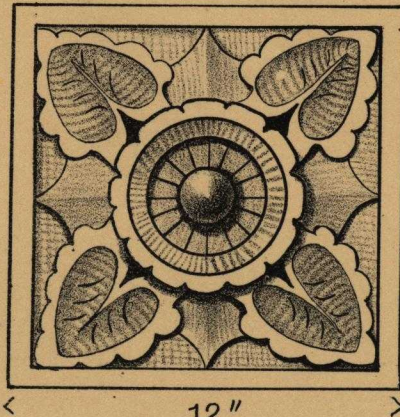
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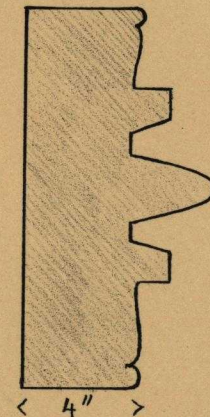
9 7/8"

20 3/4"

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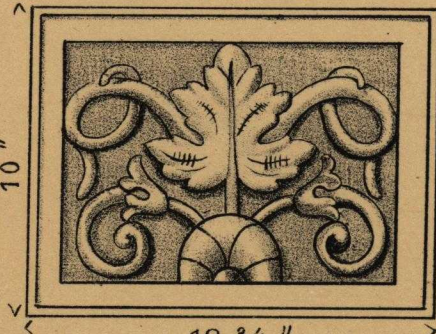


12"



4"

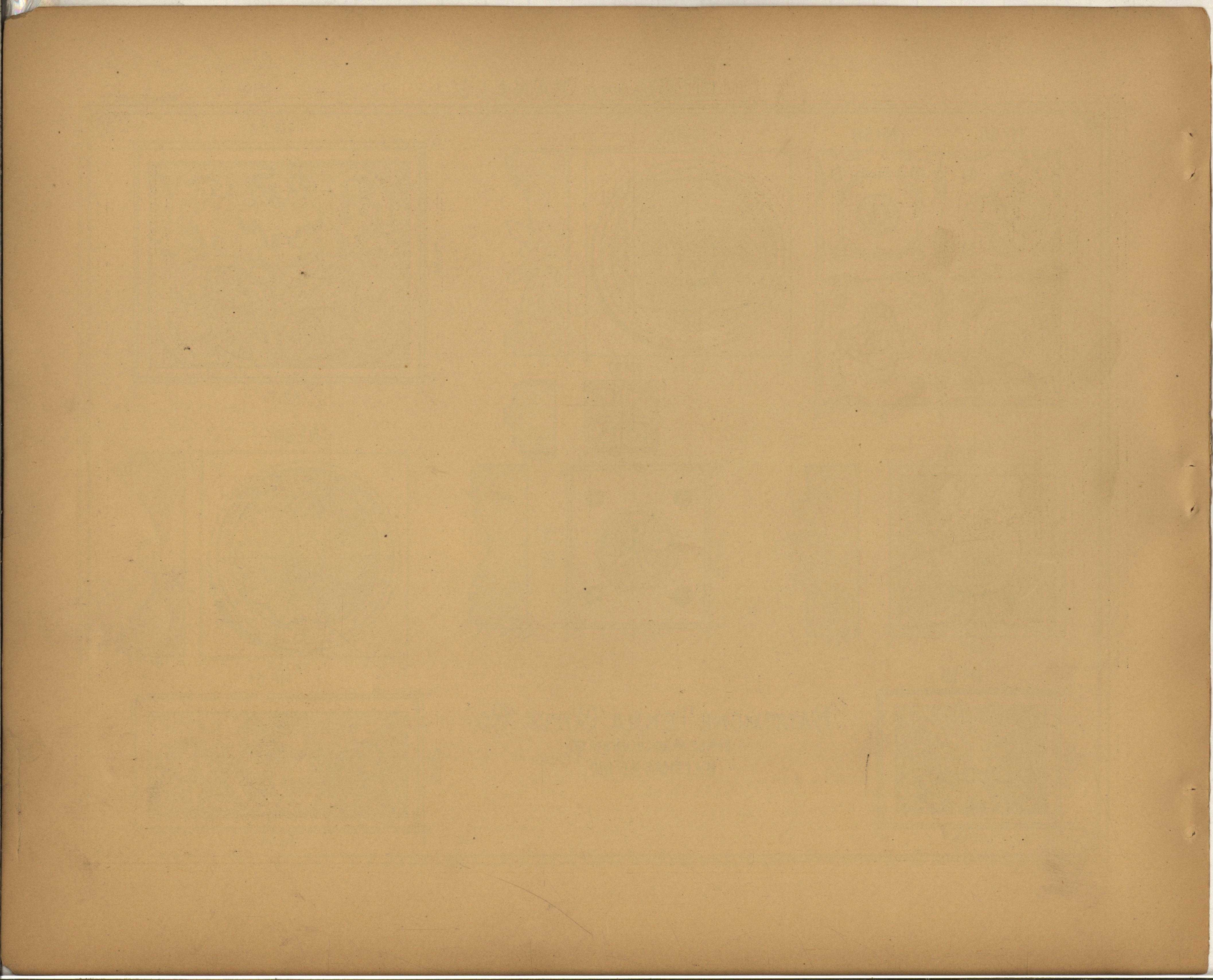
No 59.



10"

12 3/4"

BALTIMORE TERRA COTTA CO.
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No 62.



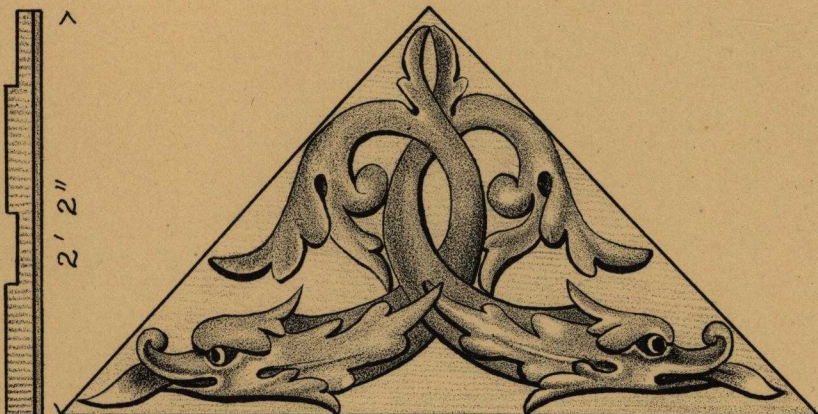
2' 10"

No 63.



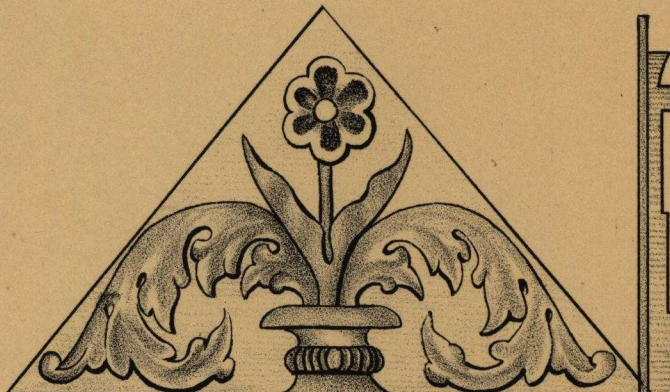
3' 3"

No 64.



4' 0"

No 65.



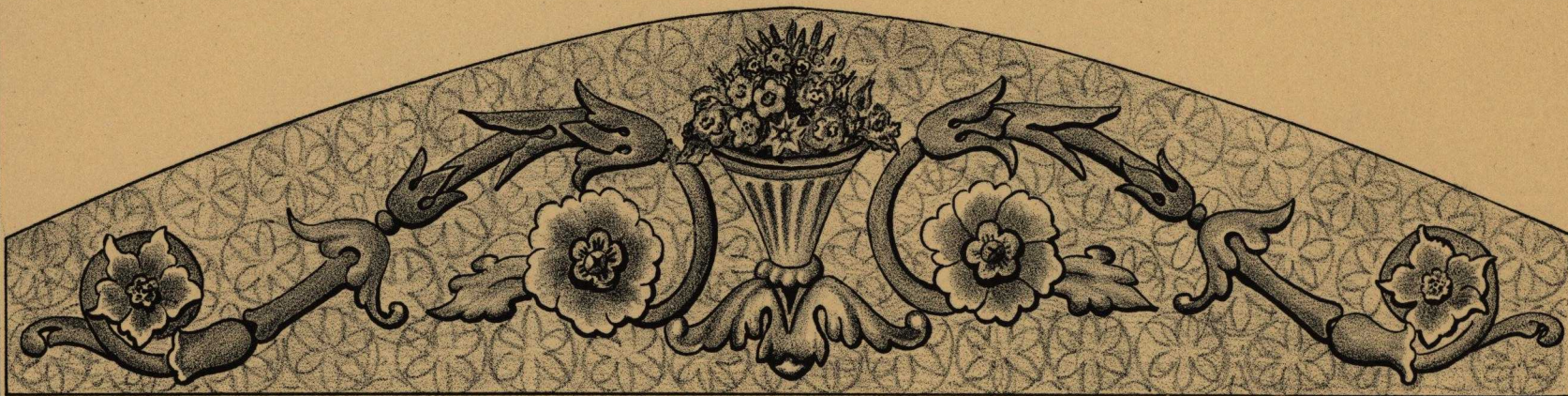
3' 4"

BALTIMORE TERRA COTTA CO.

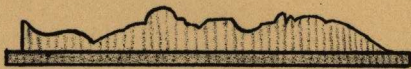
OFFICE NO 30 COLUMBIA ST.

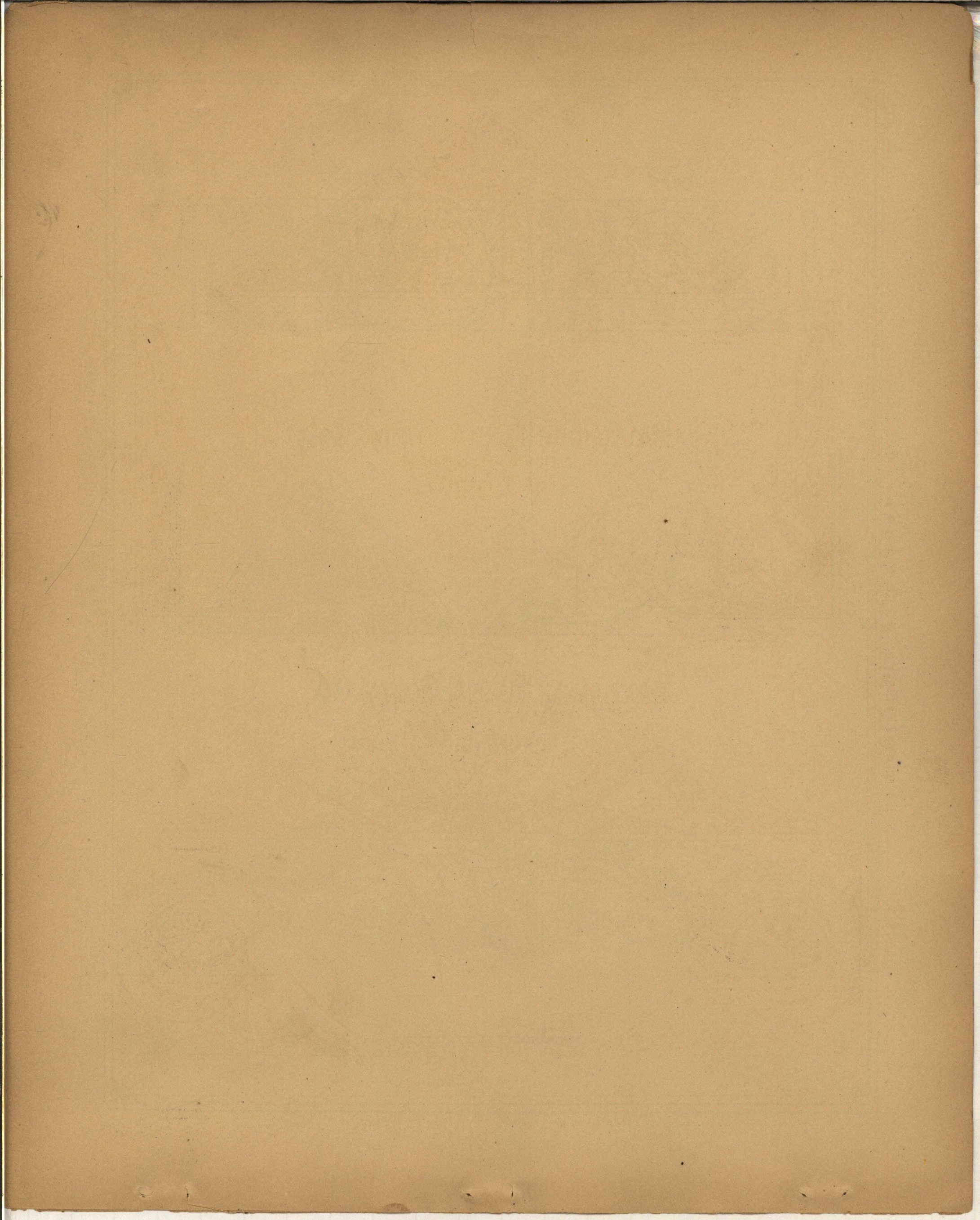
BALTIMORE MD.

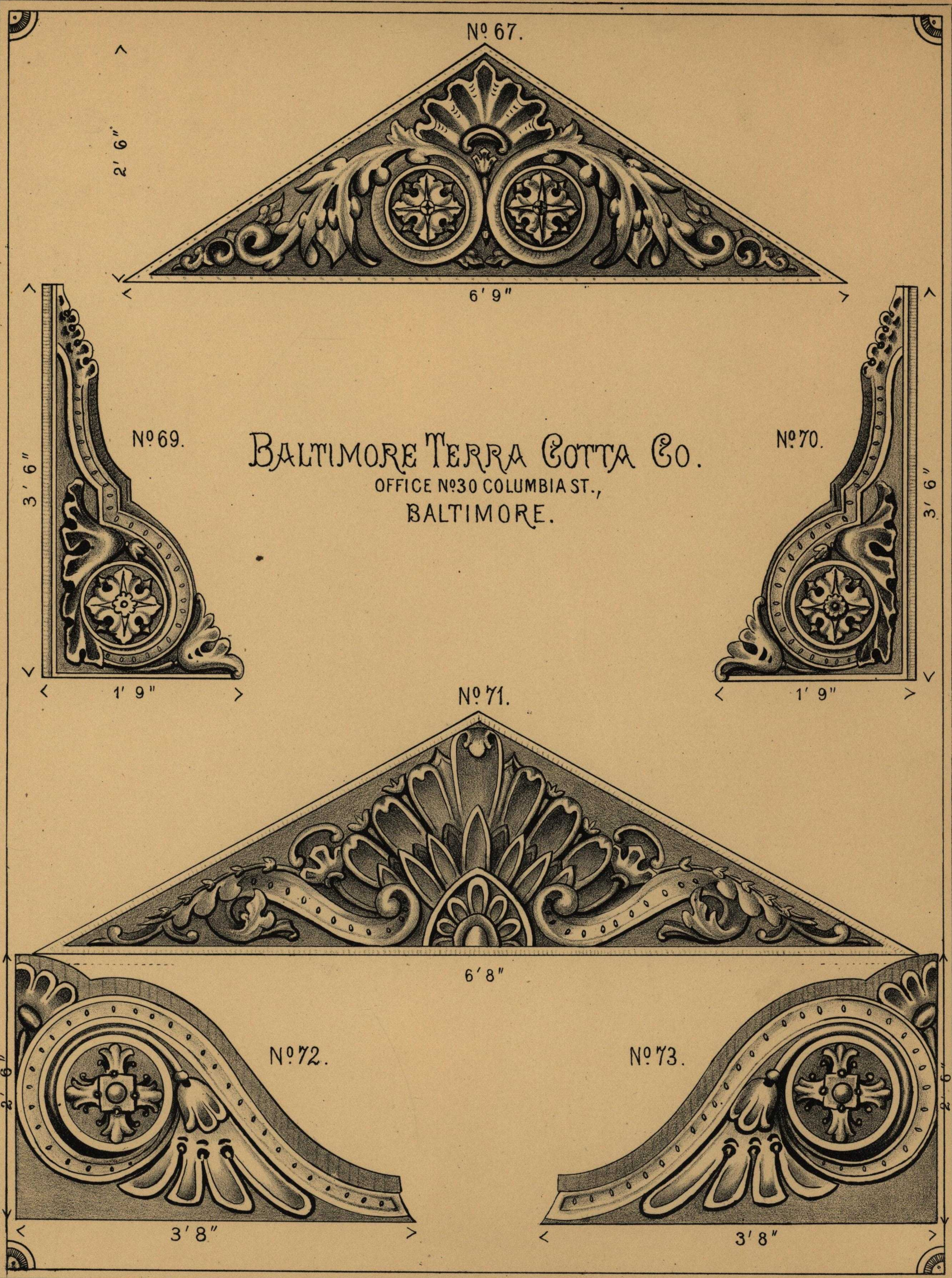
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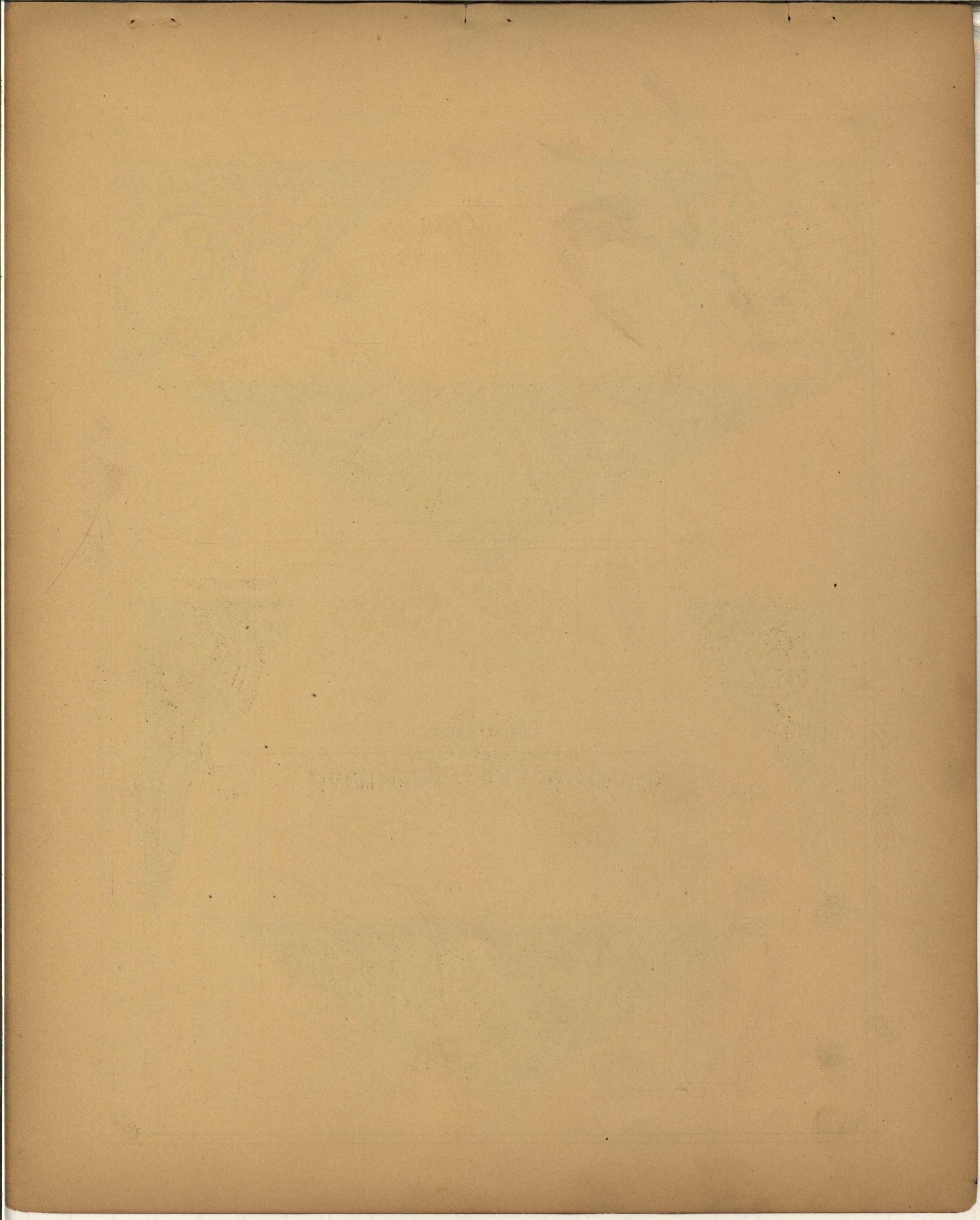


9' 0"



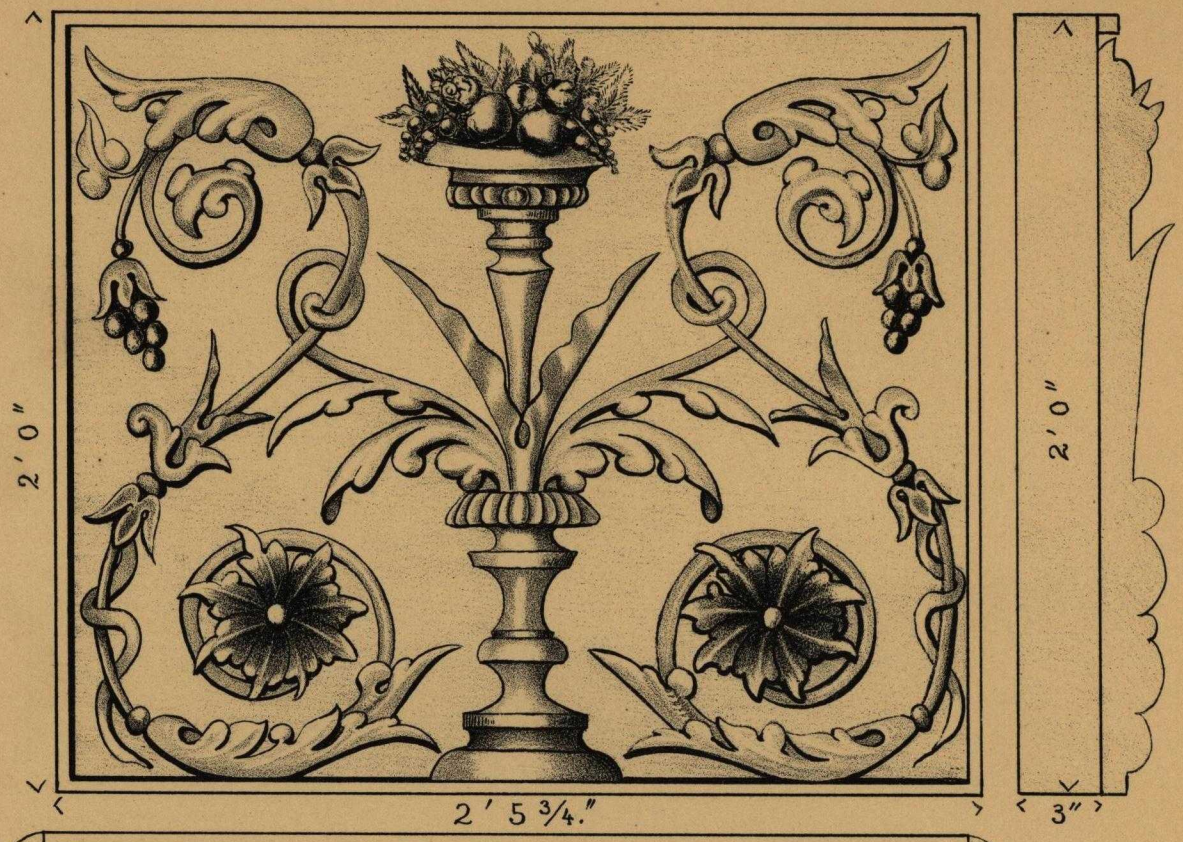




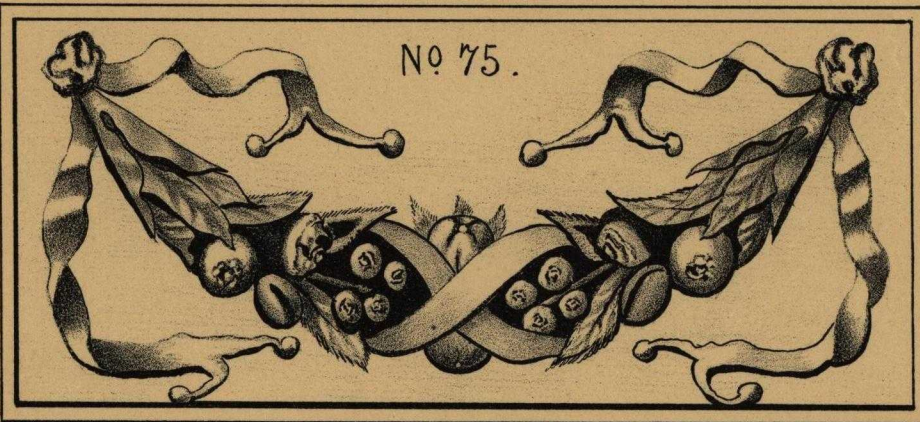


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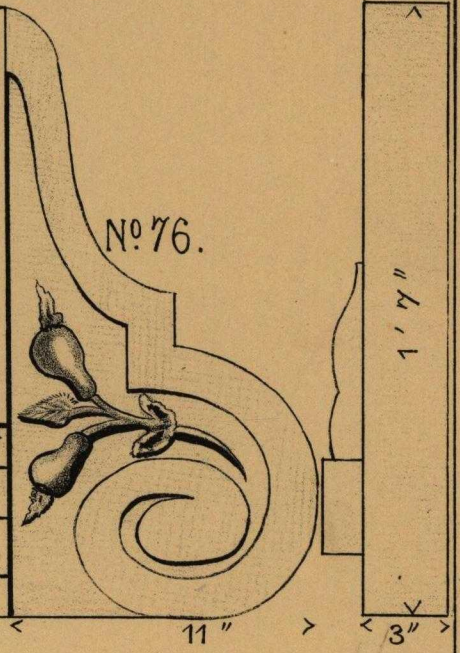
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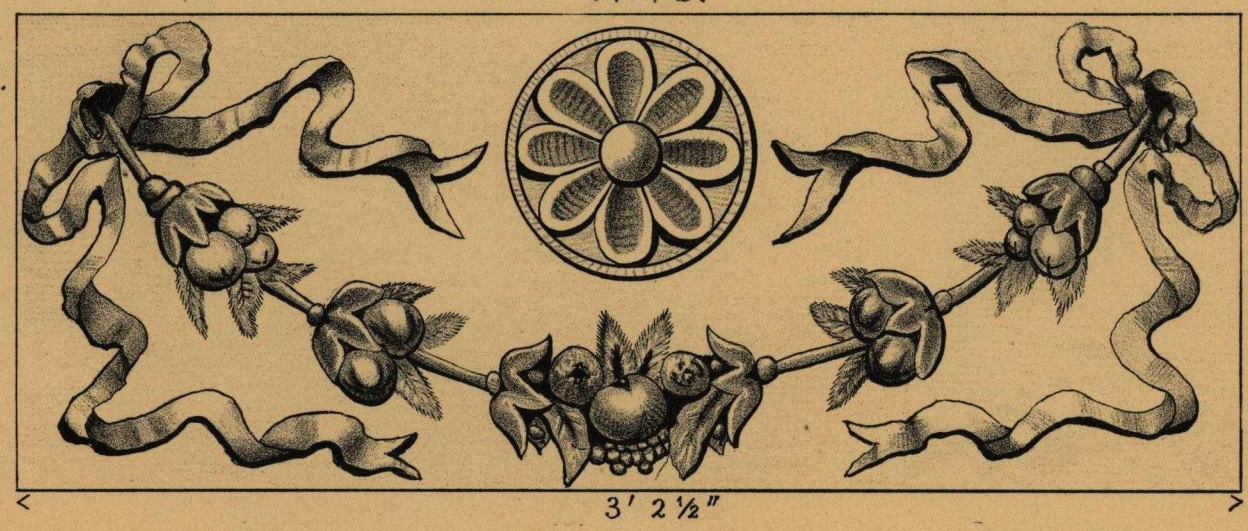
No 75.



No 76.



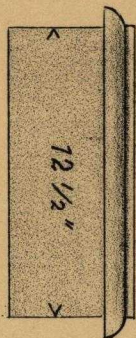
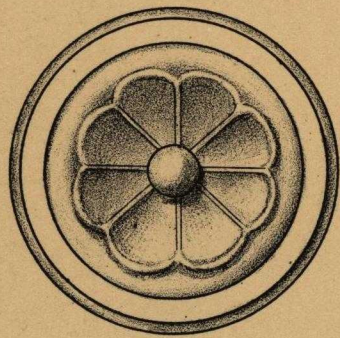
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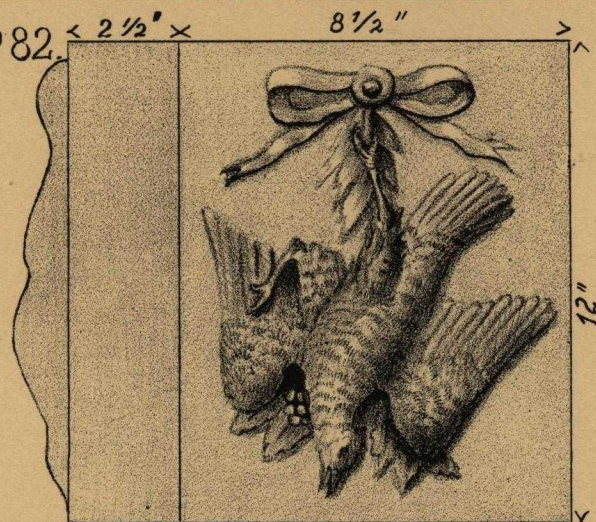
TILES & C.

PLATE N° 14.

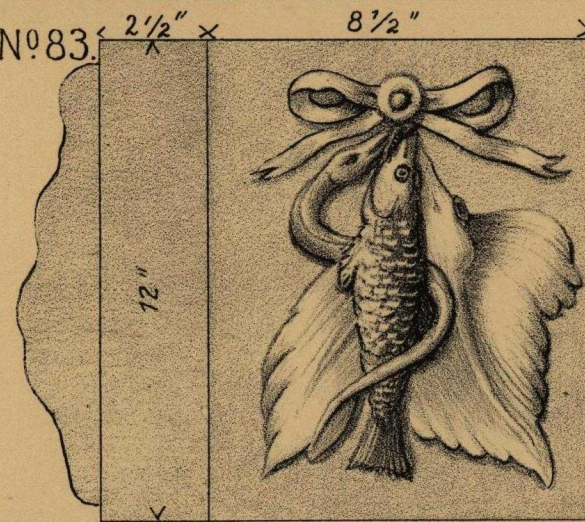
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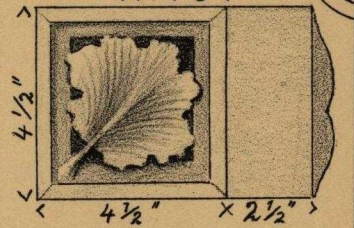
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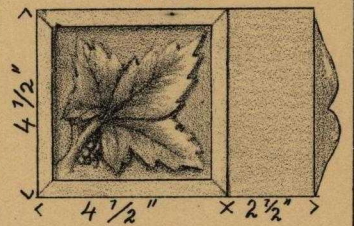
N° 83.



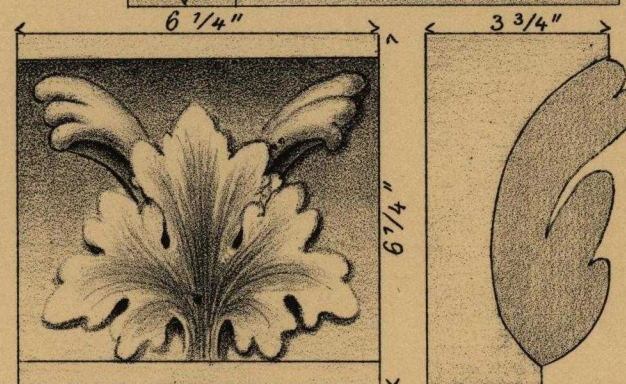
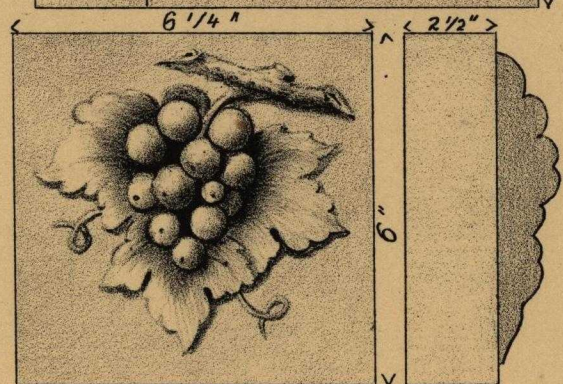
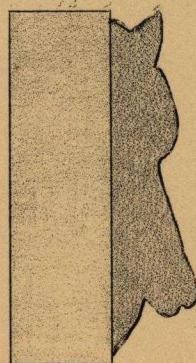
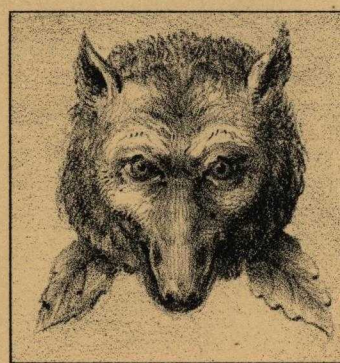
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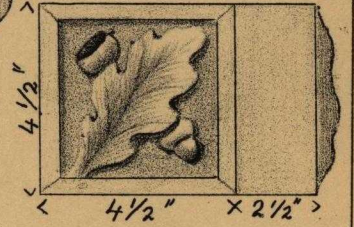
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N° 85.

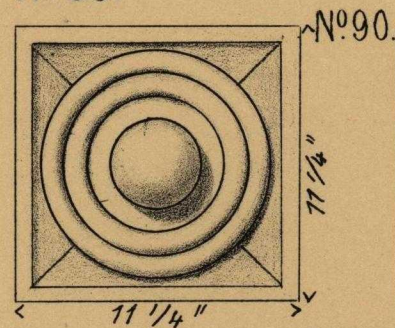
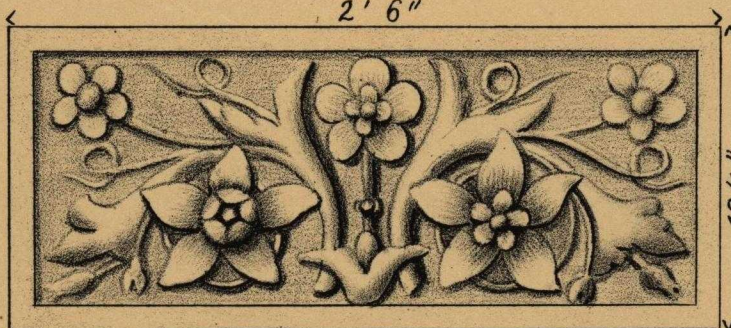


N° 81.

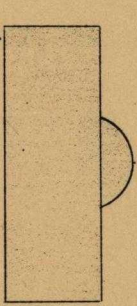


N° 86.

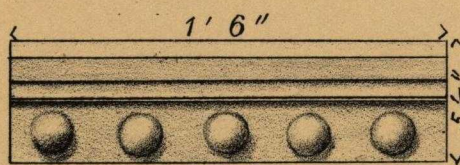
N° 87.



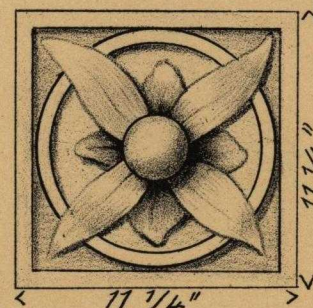
N° 90.



N° 88.



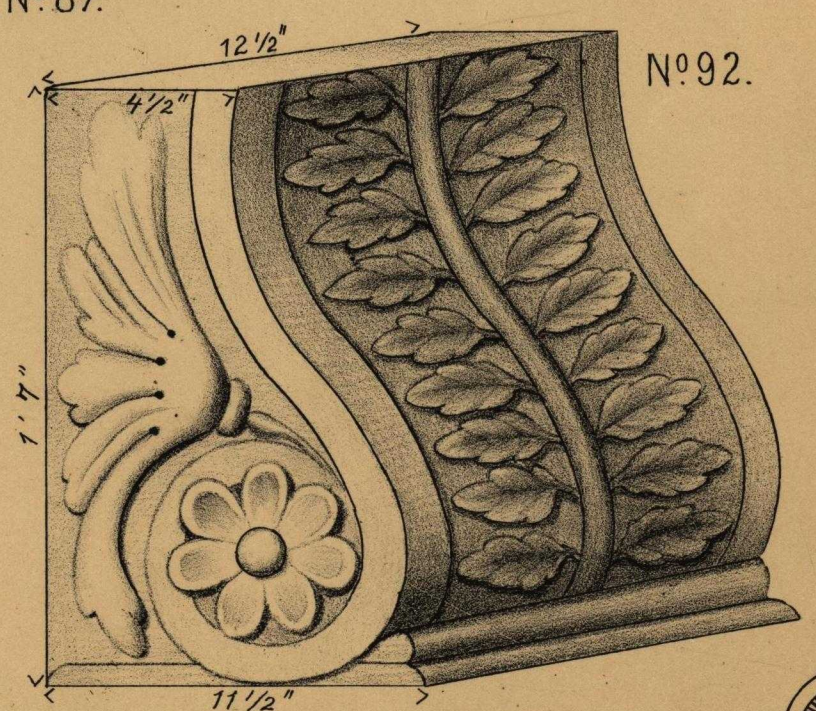
N° 89.



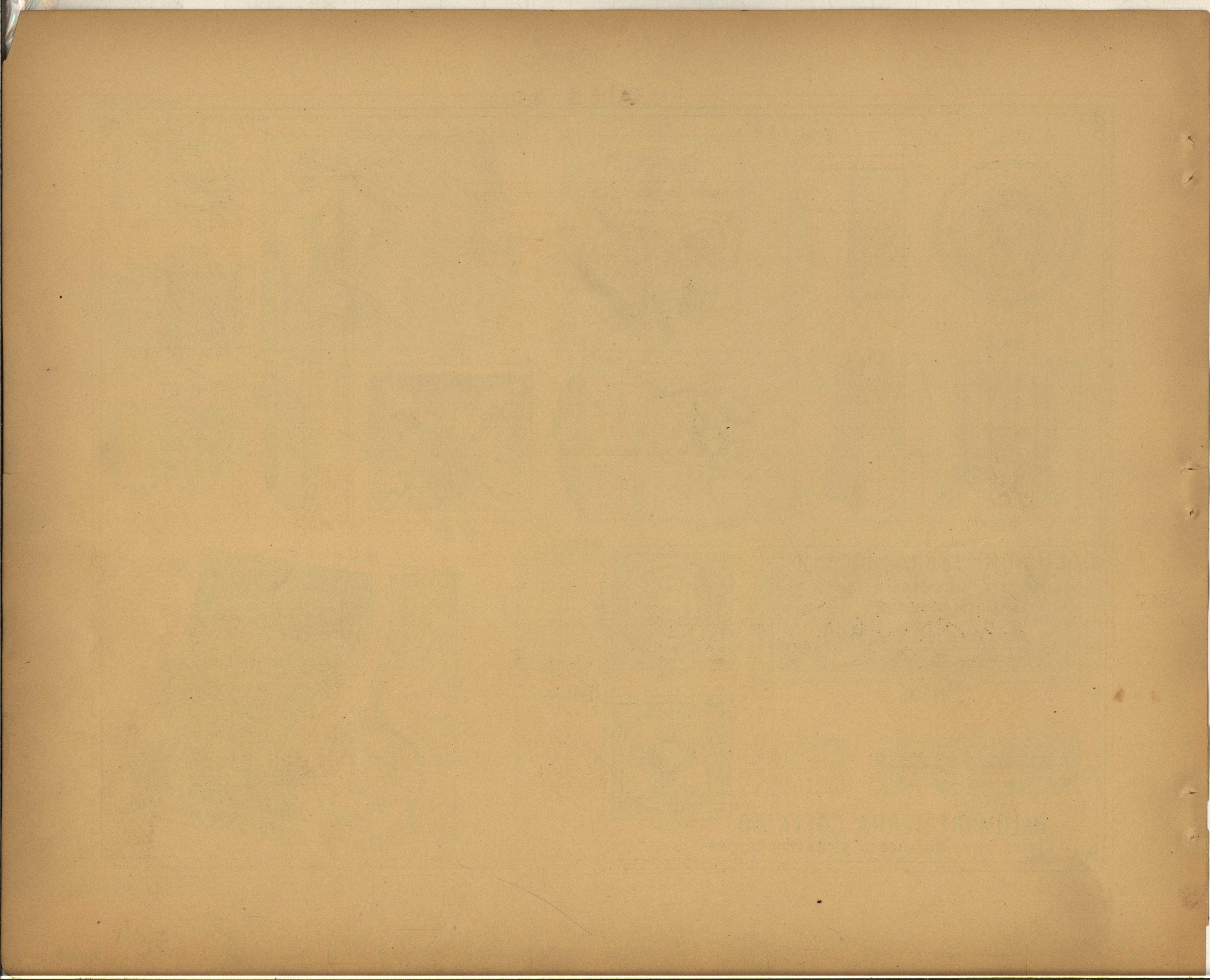
N° 91.

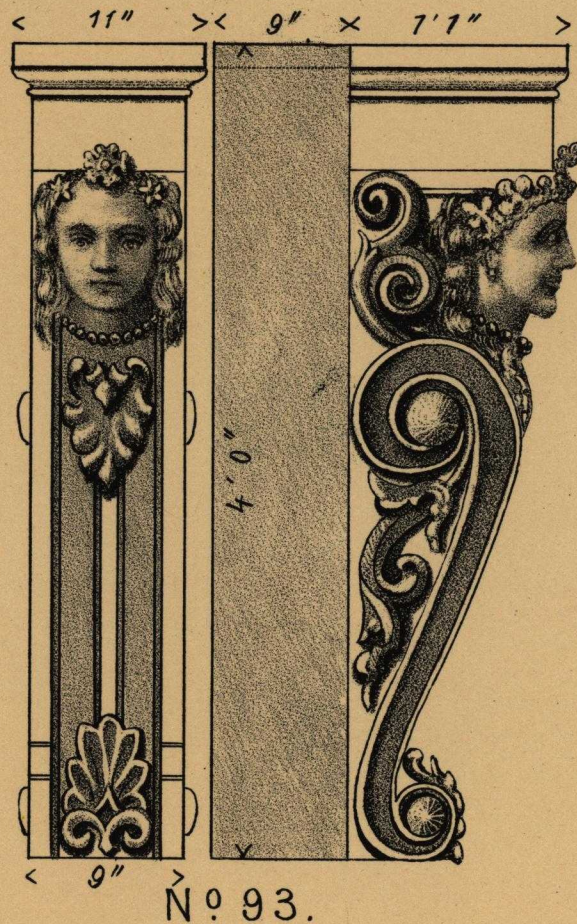


N° 92.

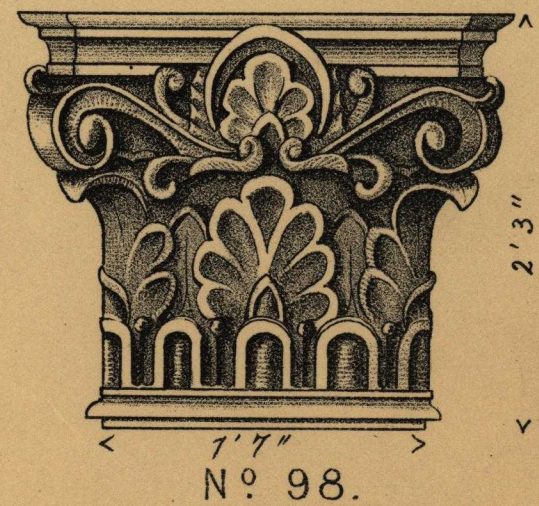
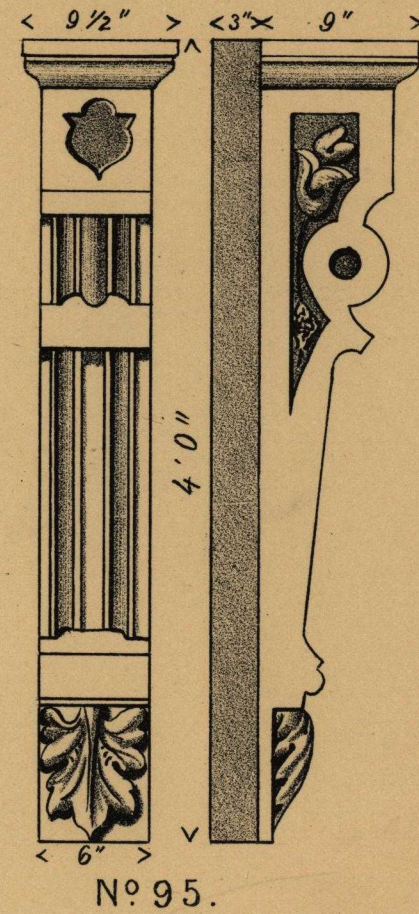
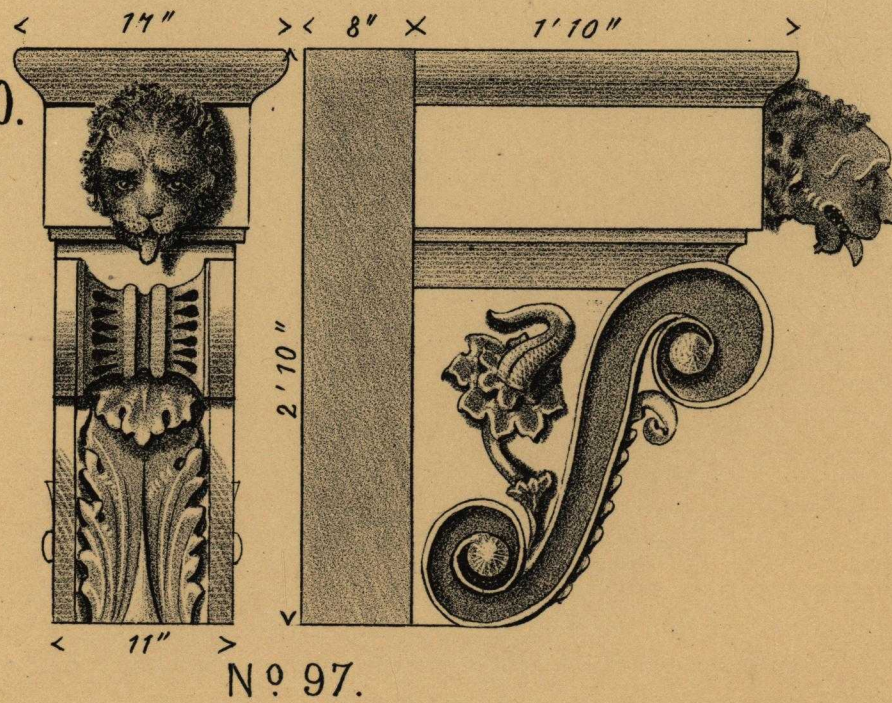
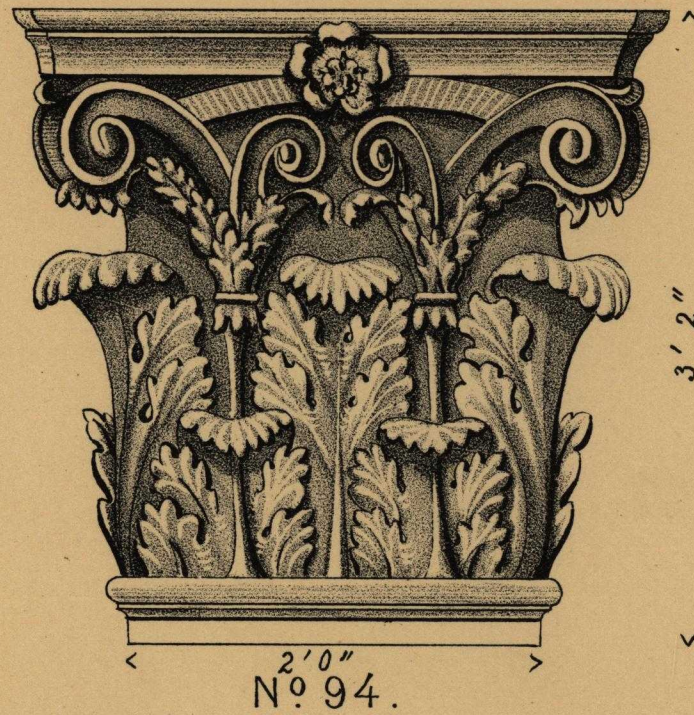
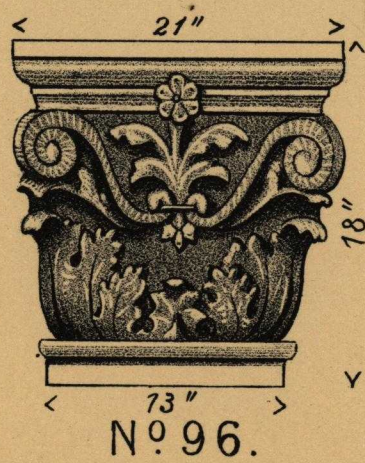


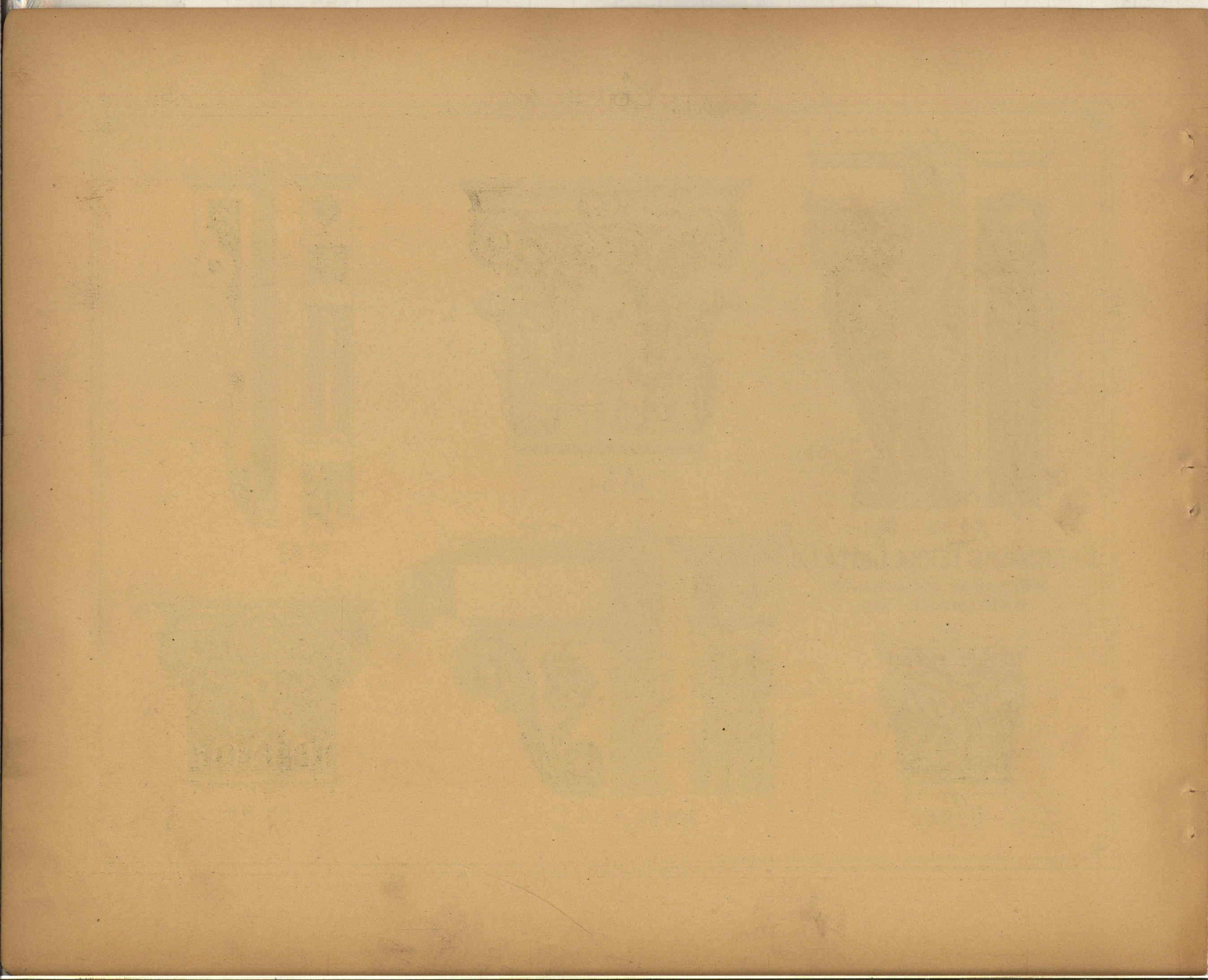
BALTIMORE TERRA COTTA CO.
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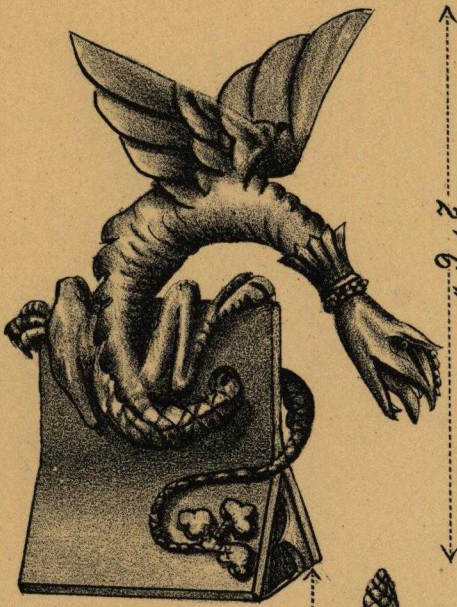




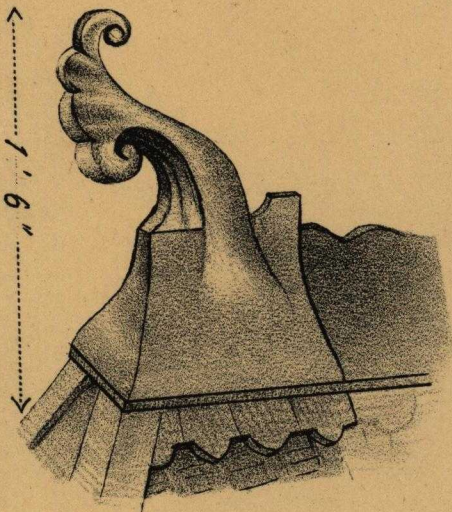
BALTIMORE TERRA COTTA CO.

OFFICE N^o 30 COLUMBIA ST.
BALTIMORE MD.

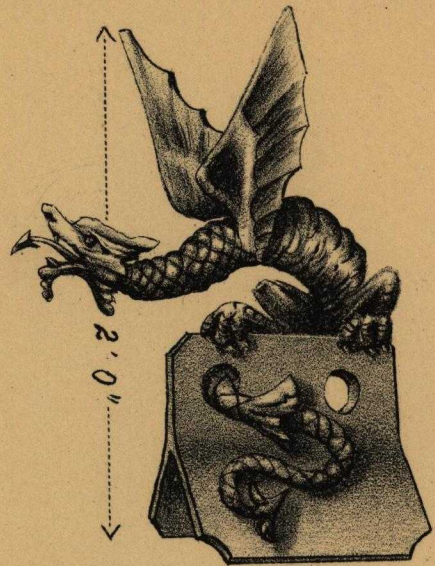




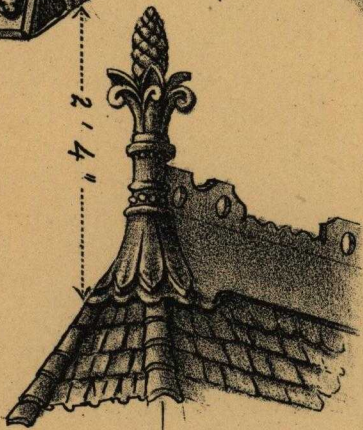
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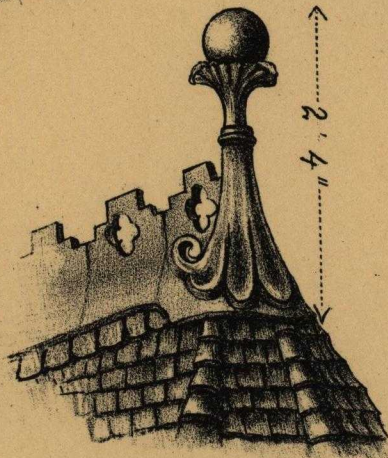
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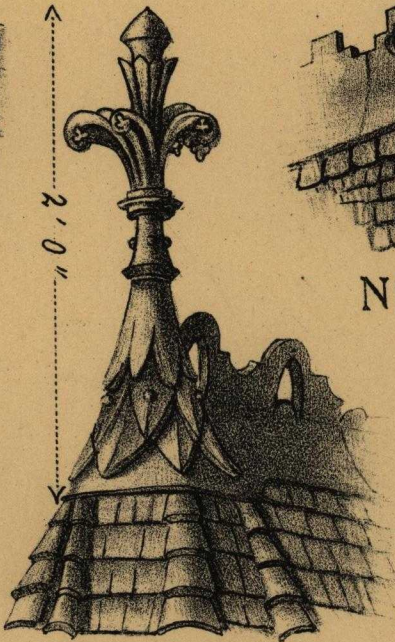
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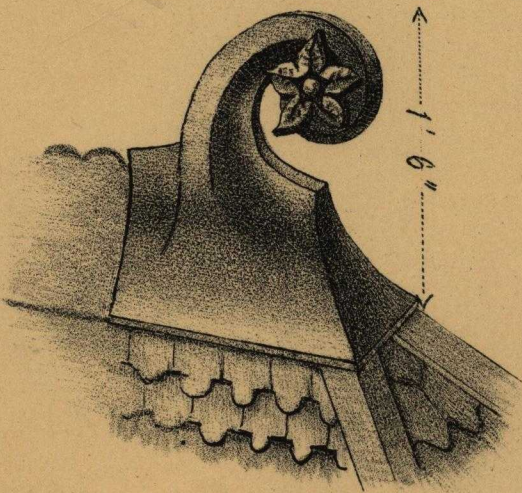
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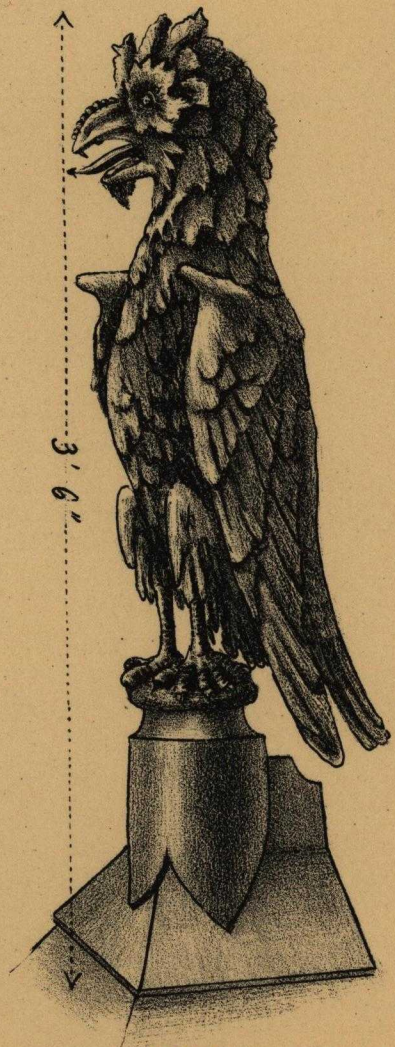
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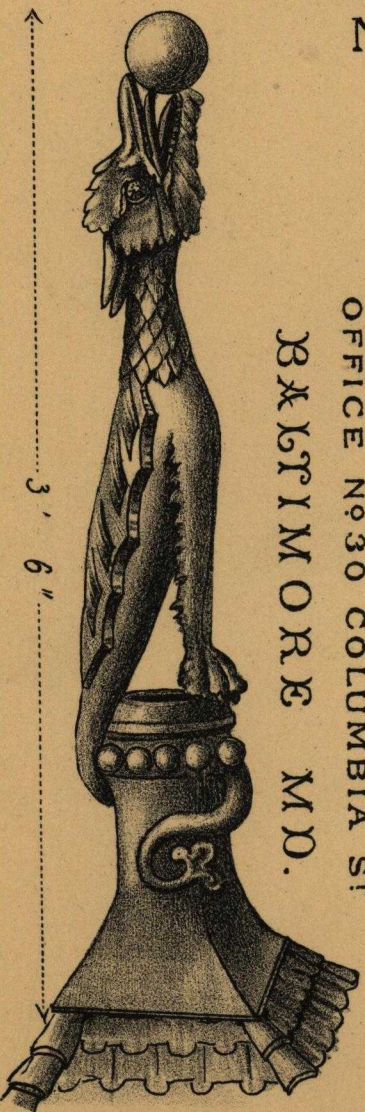
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No 8.



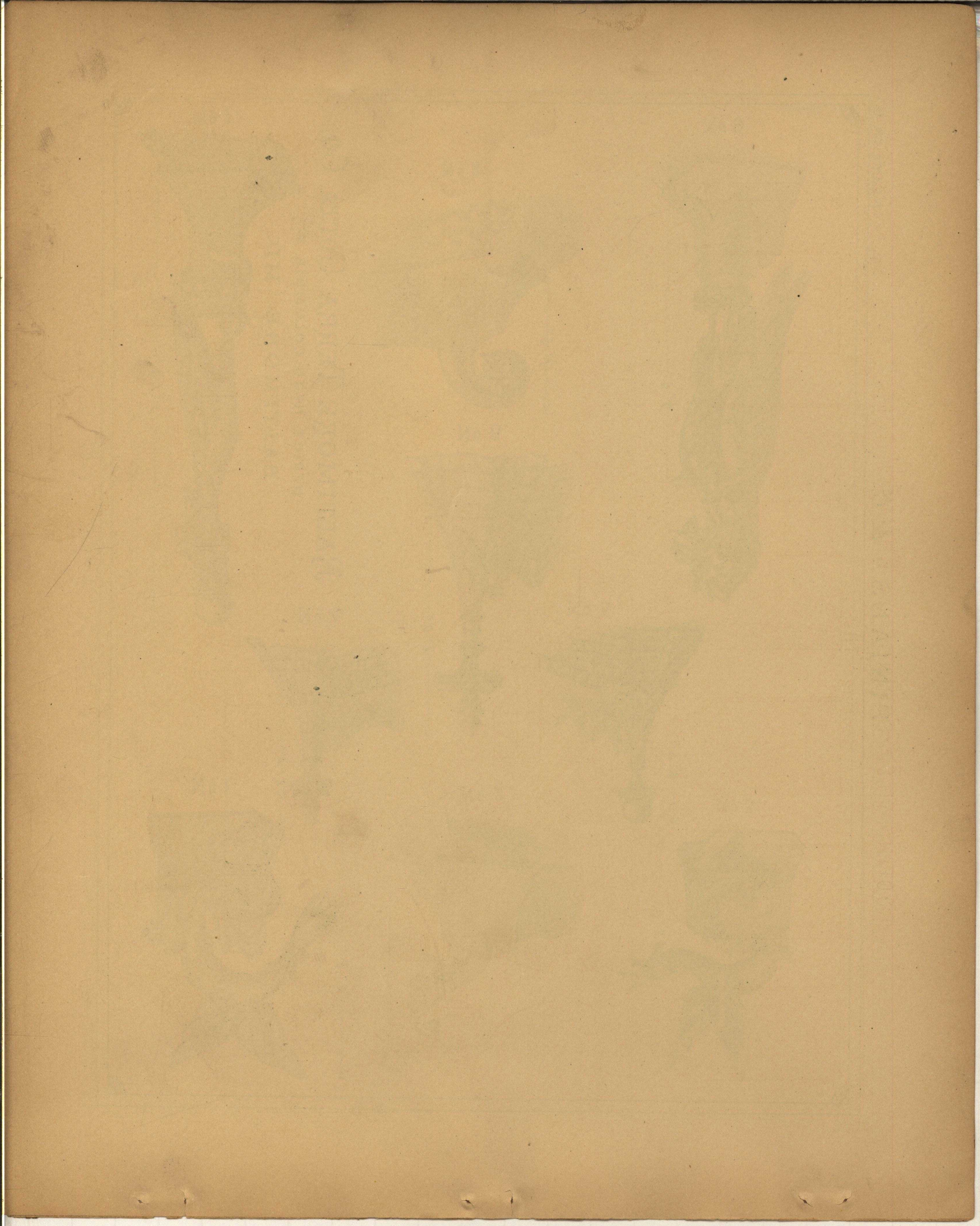
No 9.



No 7.

BALTIMORE TERRA GOTTA CO.
OFFICE NO 30 COLUMBIA ST
BALTIMORE MD.

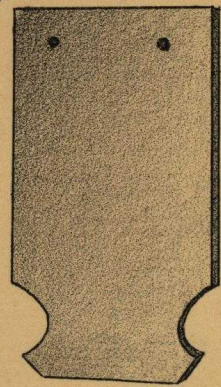
A. H. H. Co.



ROOFING TILES, COPINGS AND CHIMNEY TOPS.

PLATE N^o 17.

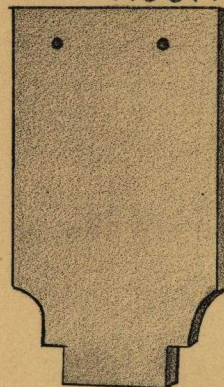
Roofing Tile.



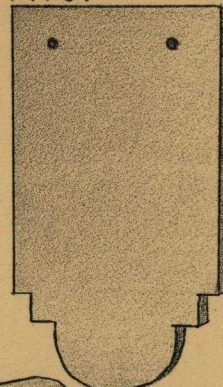
N^o 1.



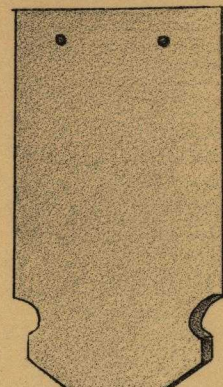
N^o 2.



N^o 3.



N^o 4.



N^o 5.



N^o 6.

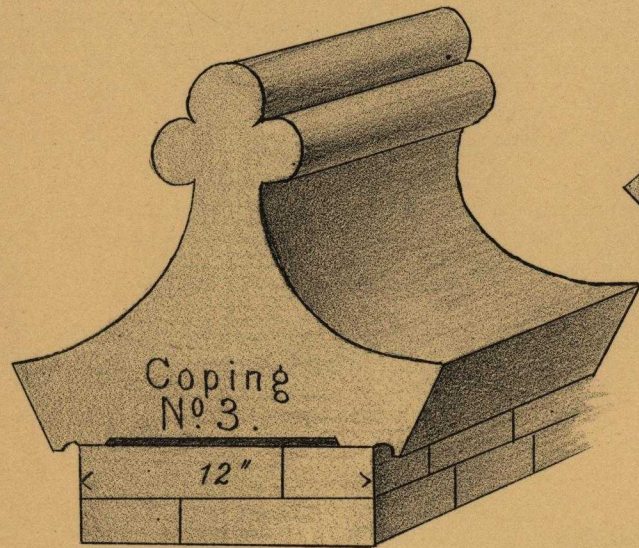


Section.

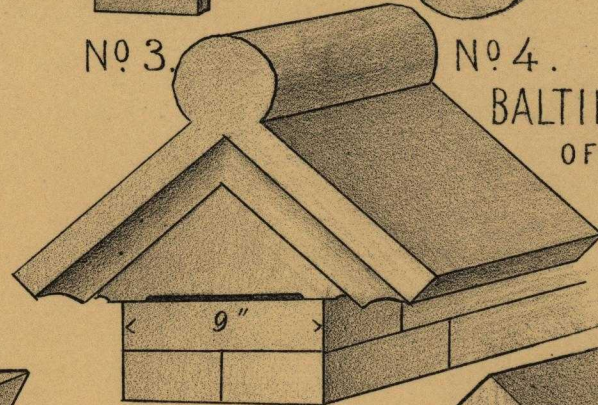
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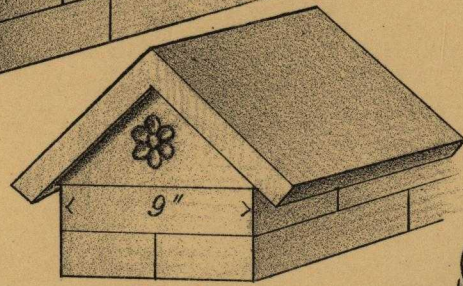
BALTIMORE MD



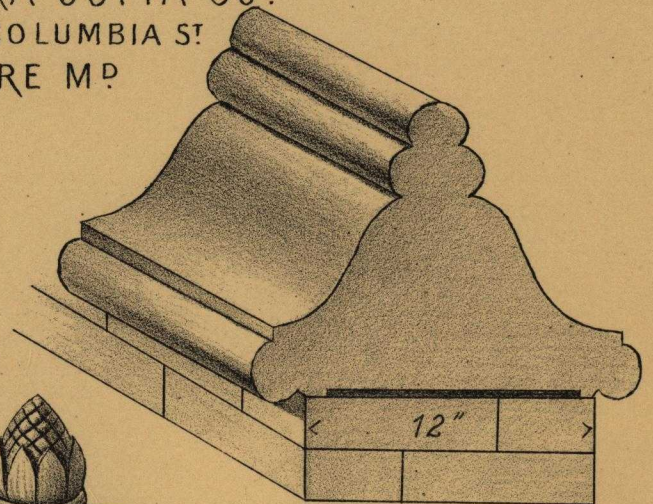
Coping
N^o 3.



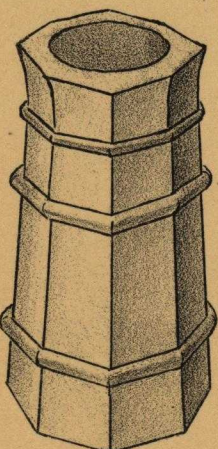
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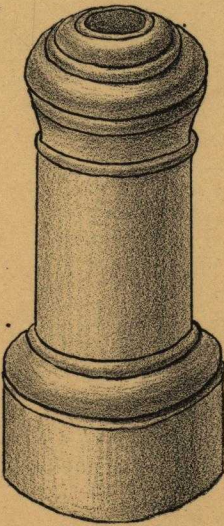
N^o 5.



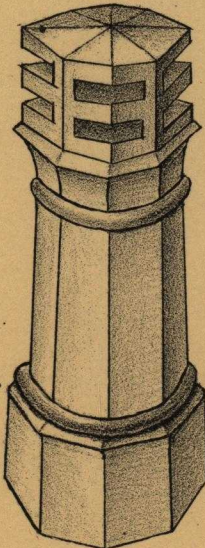
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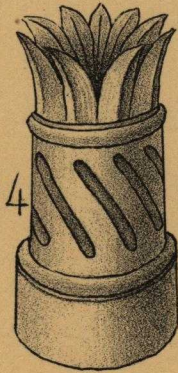
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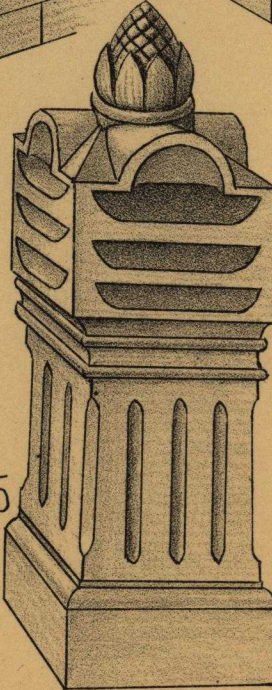
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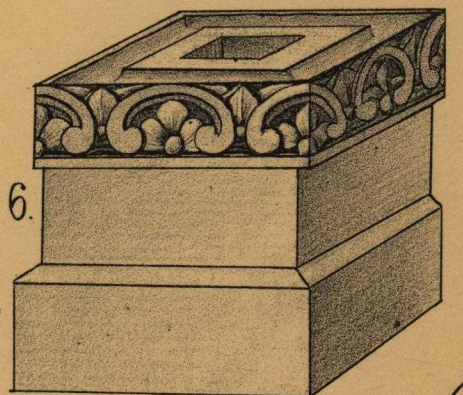
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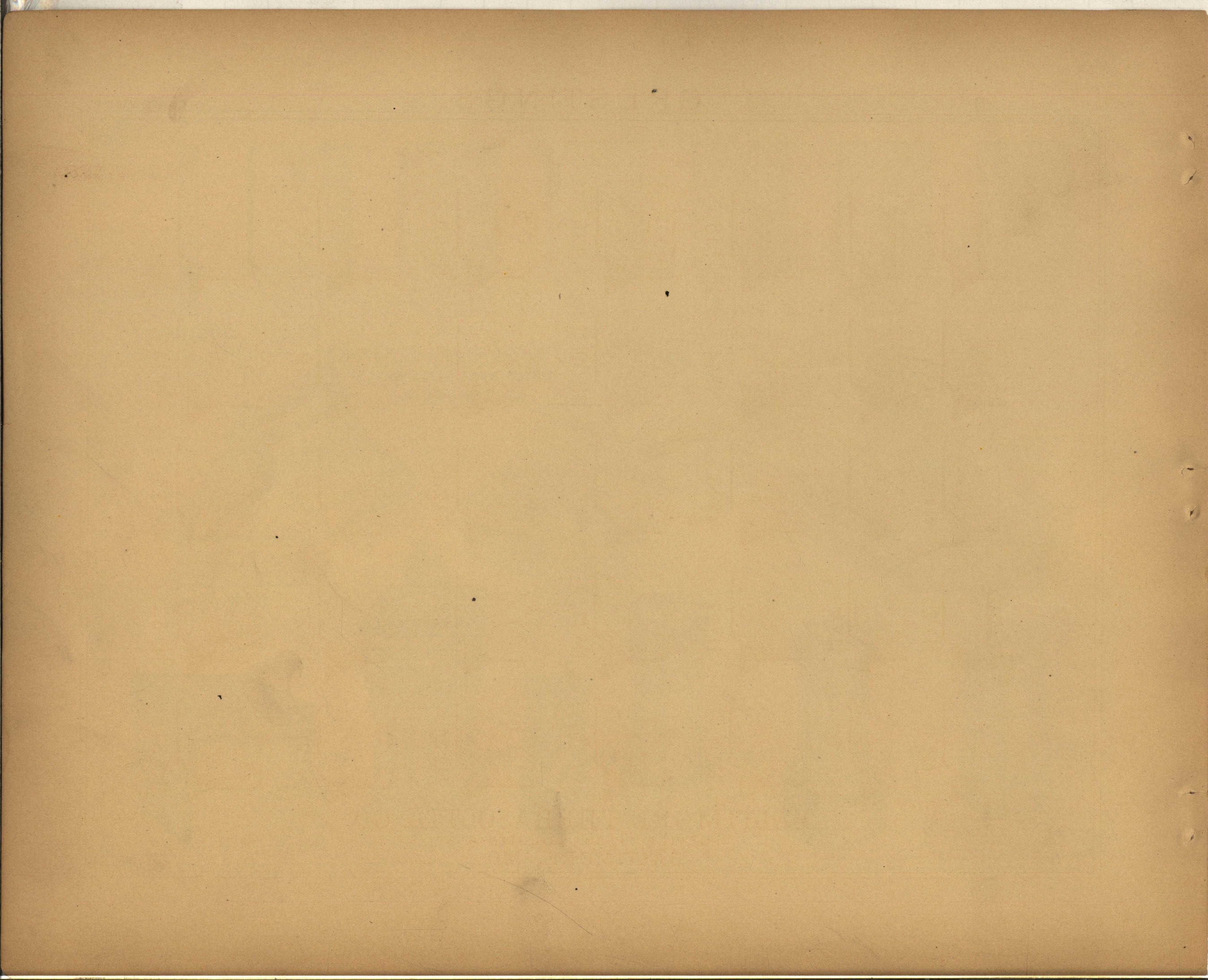
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N^o 5.



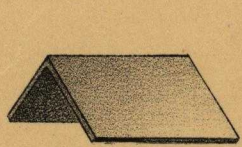
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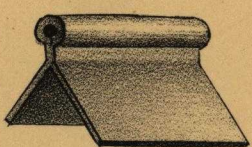
CRESTINGS.

PLATE No 18.

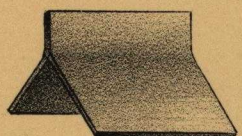
BALTIMORE TERRA COTTA CO.
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BALTIMORE, MD.



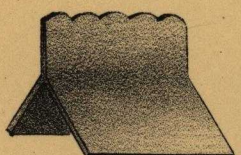
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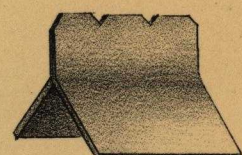
No 2.



No 3.



No 4.



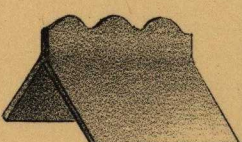
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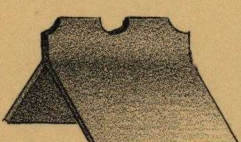
No 6.



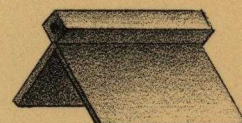
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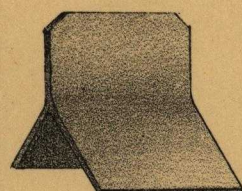
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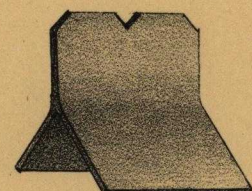
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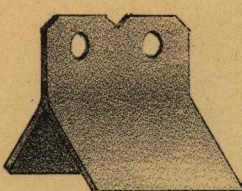
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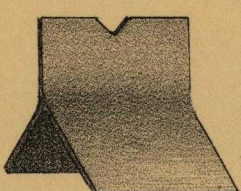
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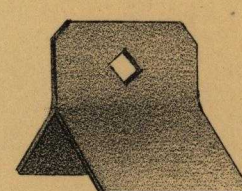
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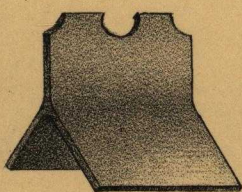
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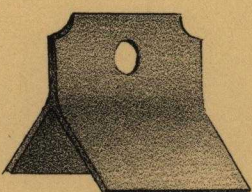
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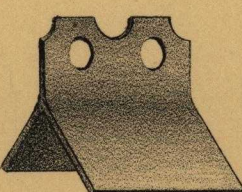
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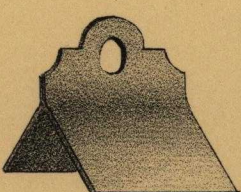
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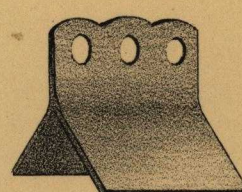
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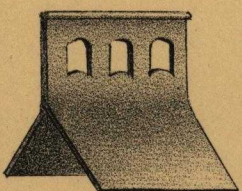
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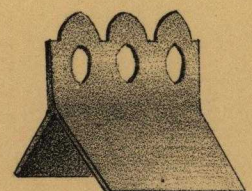
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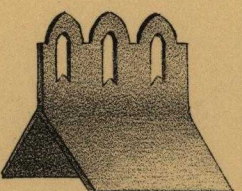
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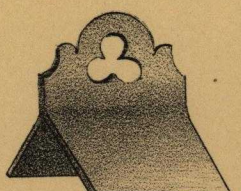
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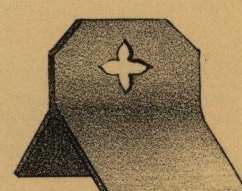
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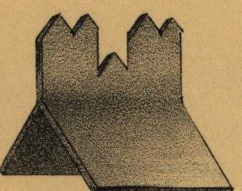
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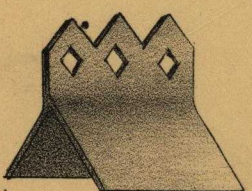
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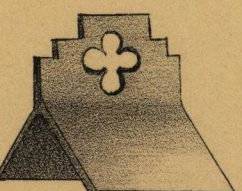
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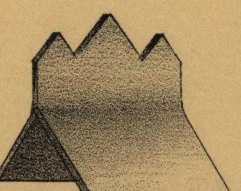
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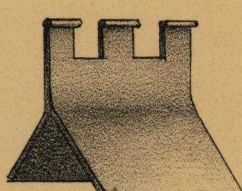
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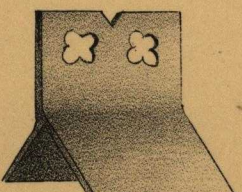
No 28.



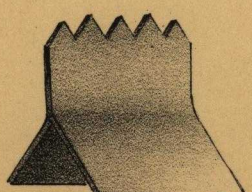
No 29.



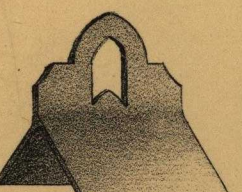
No 30.



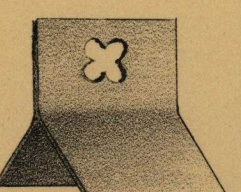
No 31.



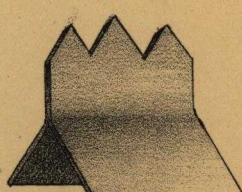
No 32.



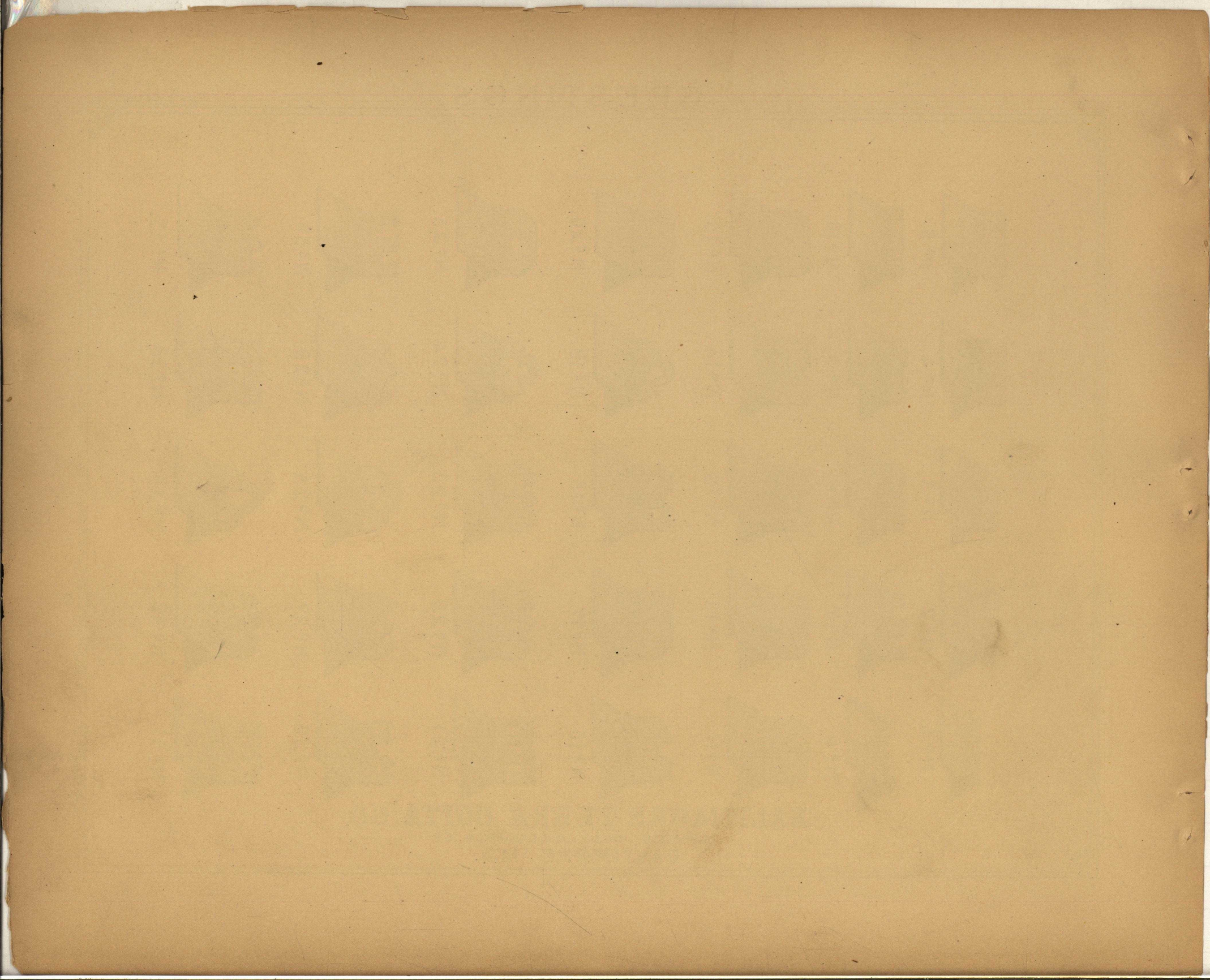
No 33.



No 34.

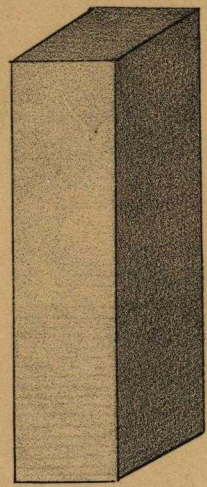


No 35.

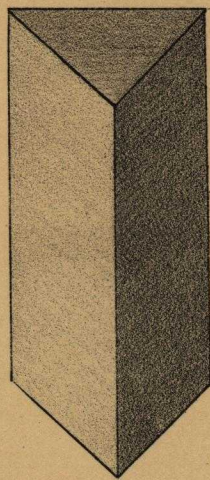


MOULDED BRICK.

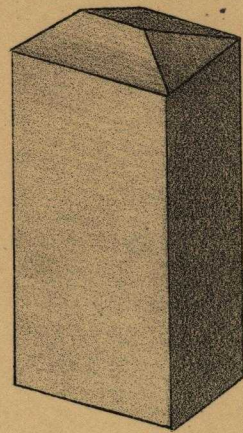
PLATE NO 19.



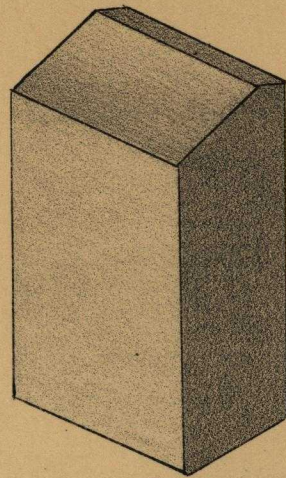
No. 1. one half Size
of Pressed Brick.



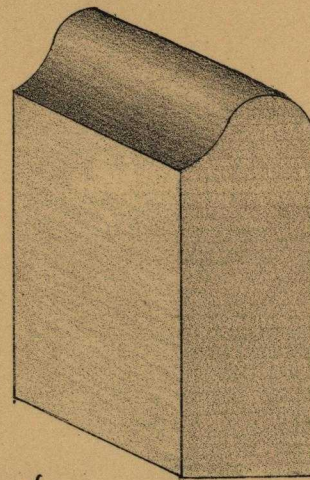
No. 2. Stretchers.



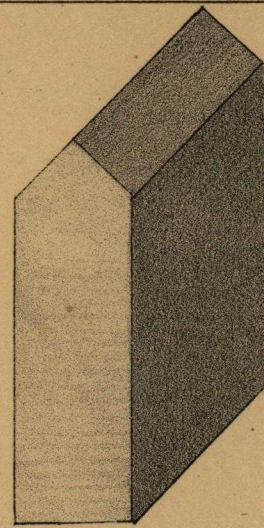
No. 4. Headers.



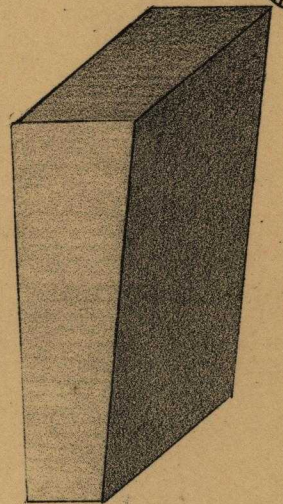
No. 5. Headers.



No. 6. Headers, Stretchers
& Returns
4" x 8".

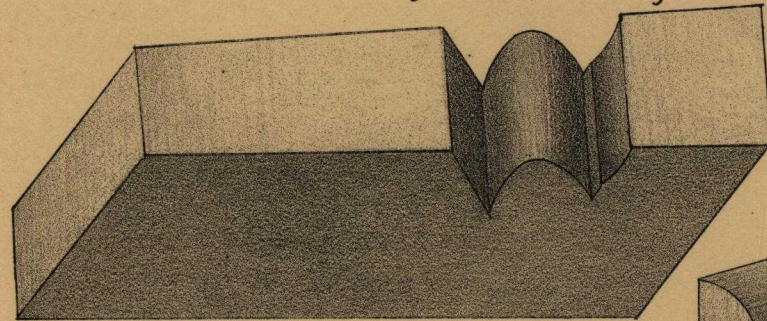
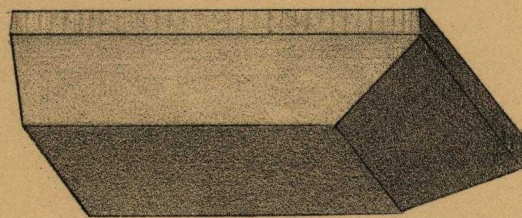


No. 8. Headers.



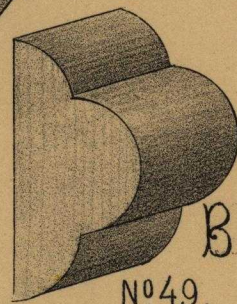
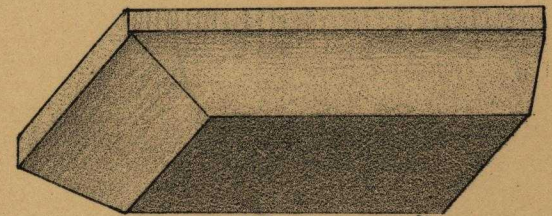
No. 10. Short Arch.

No. 7. Right Returns to No. 5 & 12.



No. 9. Arch.

No. 7. Left Returns to No. 5 & 12.



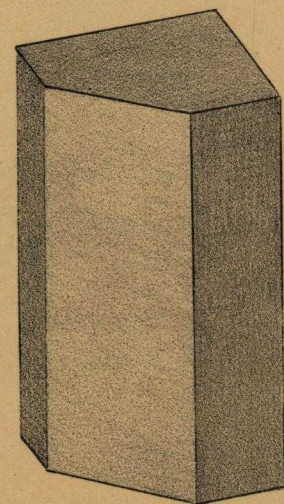
No. 49.

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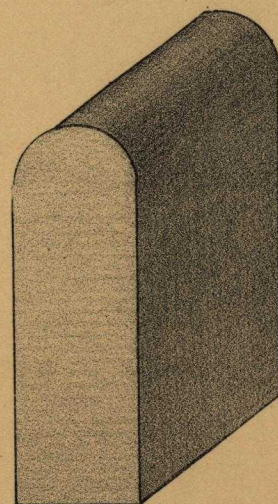
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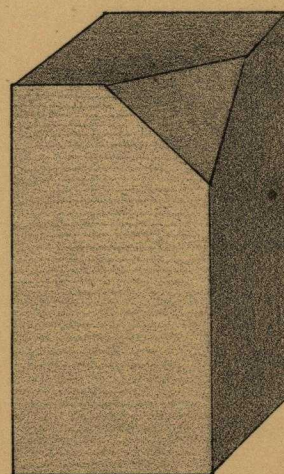
No. 11. Stretchers.



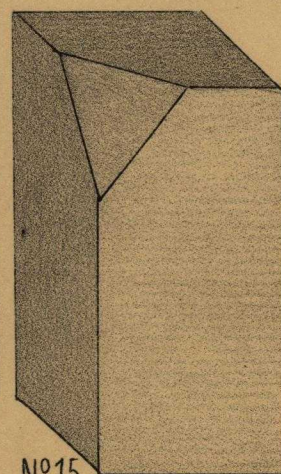
No. 12. Stretchers.



No. 13. Headers.

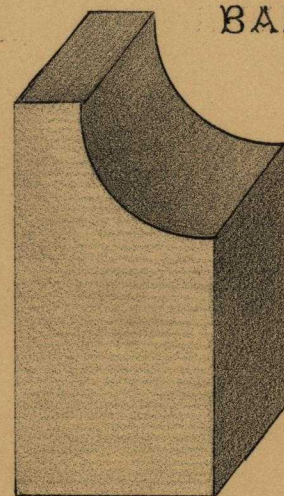


No. 14. Starters for No. 10.

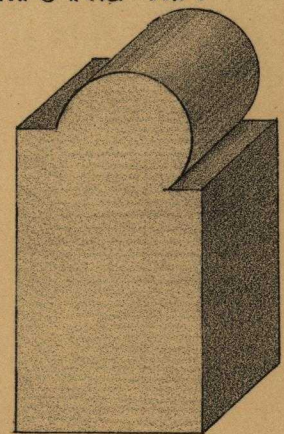


No. 15.

Starters for No. 169.



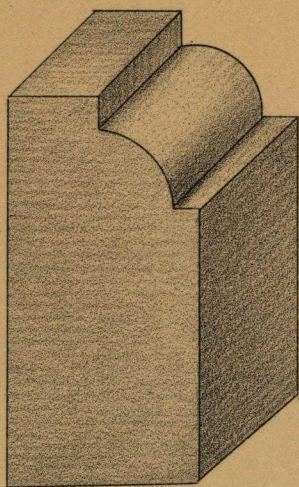
No. 16. Headers.



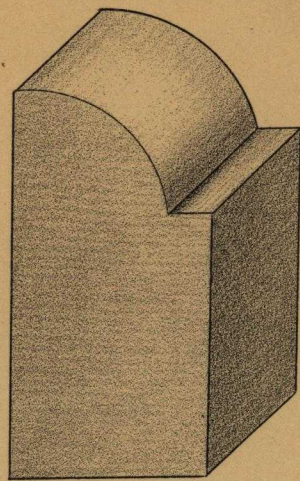
No. 17. Headers.

MOULDED BRICK.

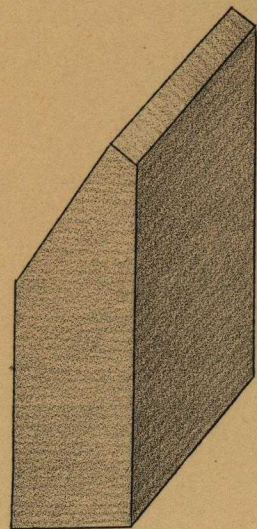
PLATE Nº 20.



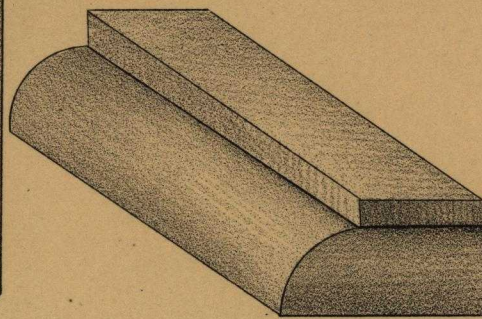
Nº 18. Headers.
Reverses for Jambs



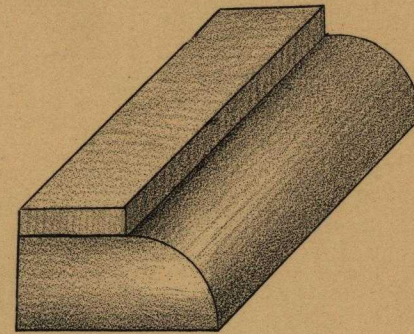
Nº 19. Headers.
Reverses for Jambs.



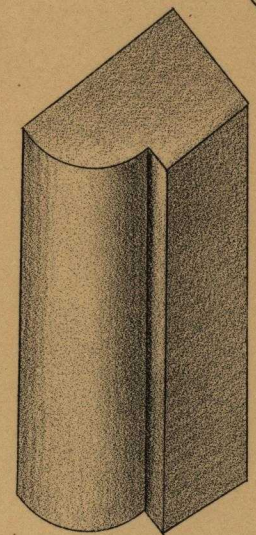
Nº 20. Headers.



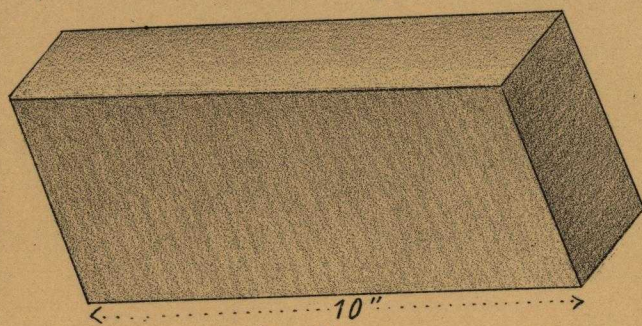
Nº 21. Right.
Returns for Nº 22.



Nº 21. Left.
Returns for Nº 22.



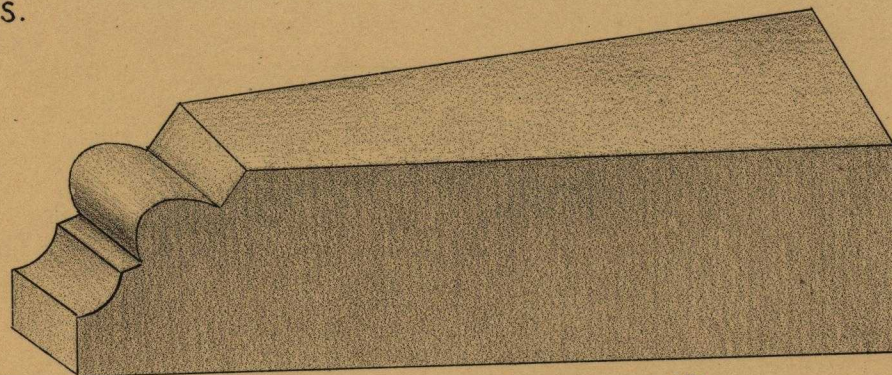
Nº 22. Stretchers.



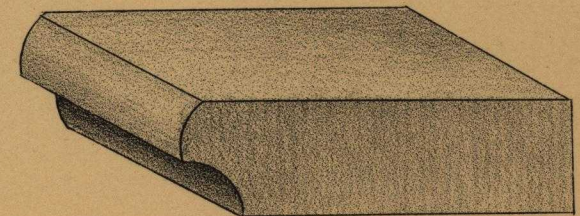
Nº 23.

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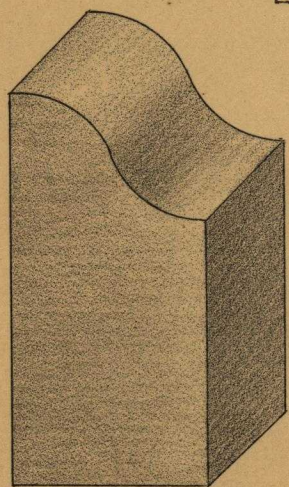
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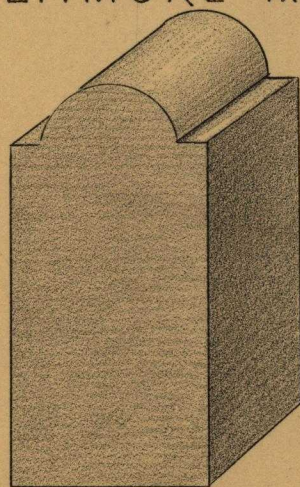
Nº 53. Long Arch 15 1/4" Long.



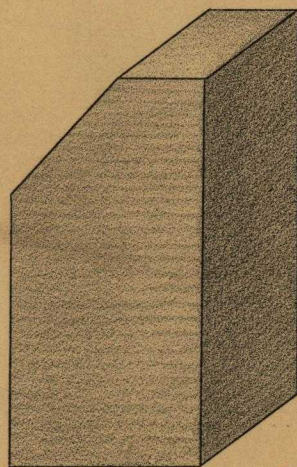
Nº 24. Headers.



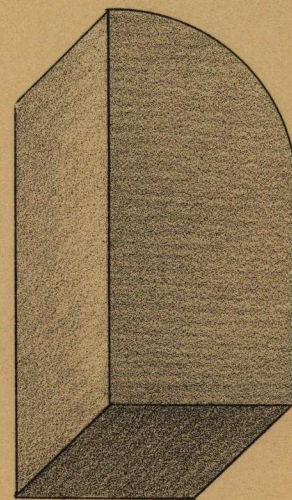
Nº 25. Headers.



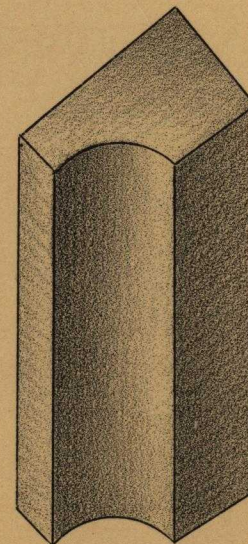
Nº 26. Headers.



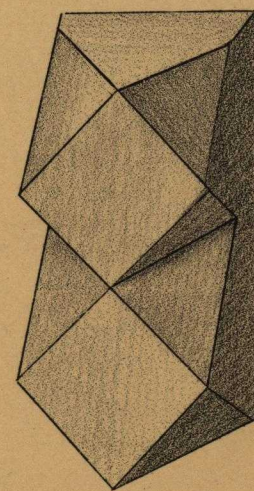
Nº 27.



Nº 28. Headers Reverses for Jambs.



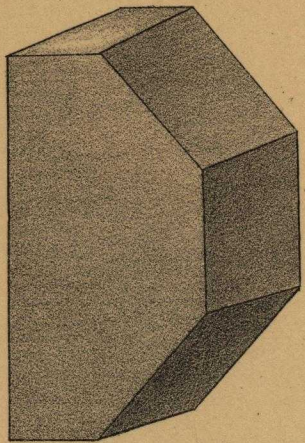
Nº 29. Stretchers.



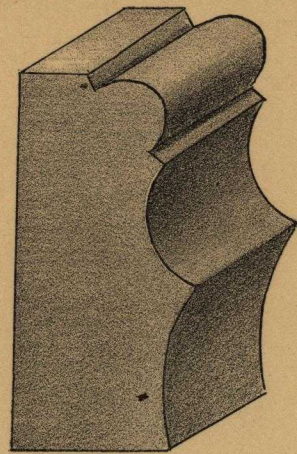
Nº 30. Stretchers.

MOULDED BRICK.

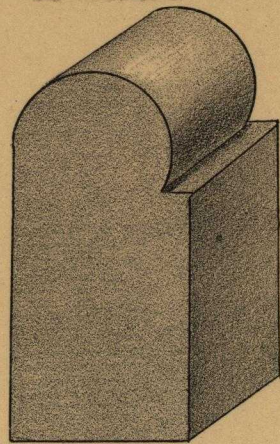
PLATE No 21.



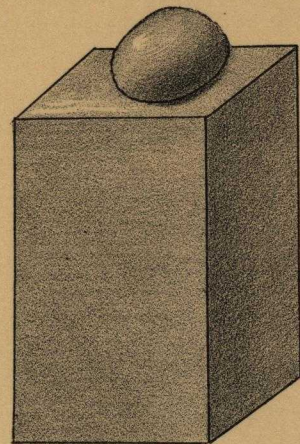
No. 31 Panel Brick
works with No. 70.



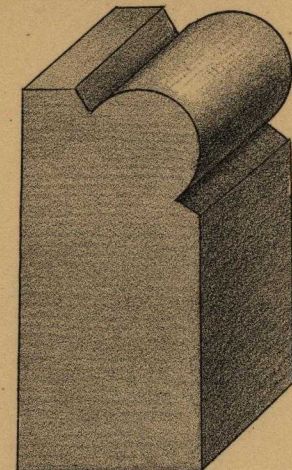
No. 32.
Stretchers.



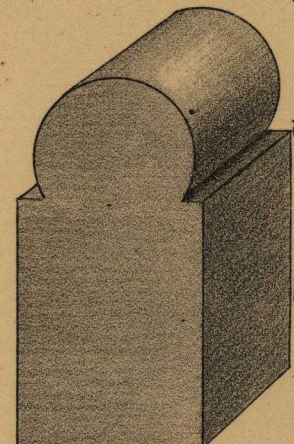
No. 33.
Headers.



No. 34.
Headers.

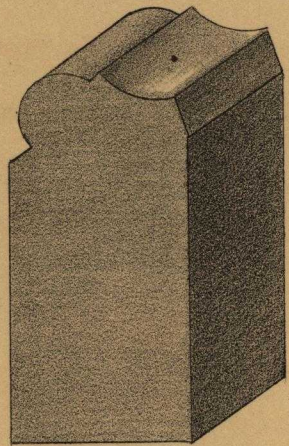


No. 35.
Headers, Reverses.

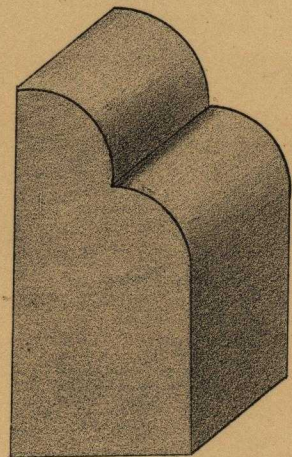


No. 36
Headers.

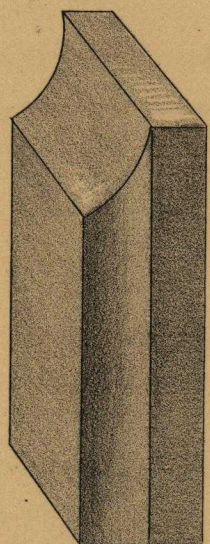
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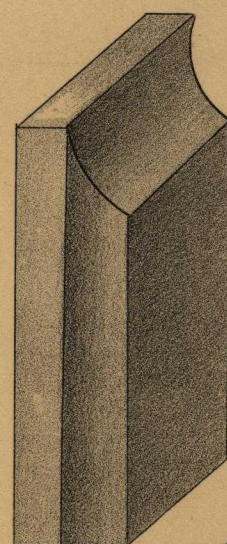
No. 37.
Headers.



No. 38.
Headers, Reverses.



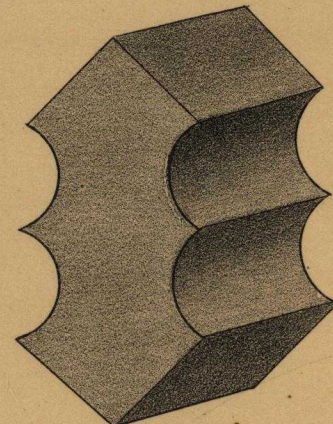
47 Right.



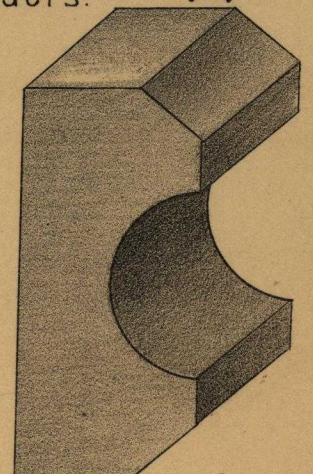
47 Left



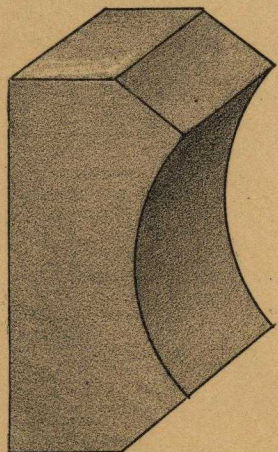
No. 58.
Skew for Girders



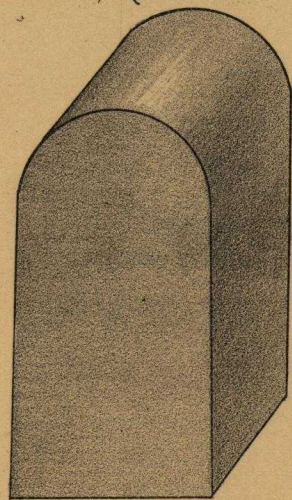
No. 39.



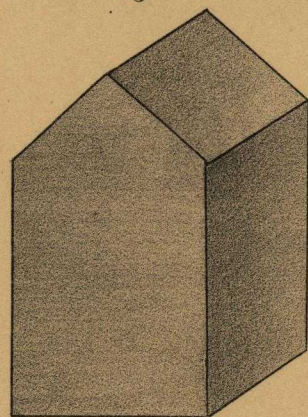
No. 40. Stretchers.



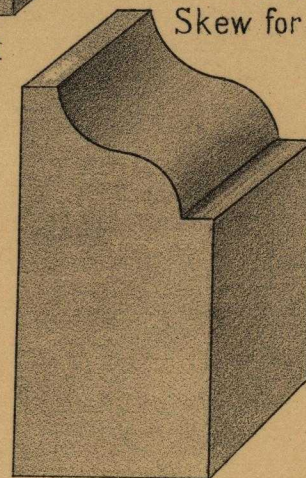
No. 41. Stretchers.



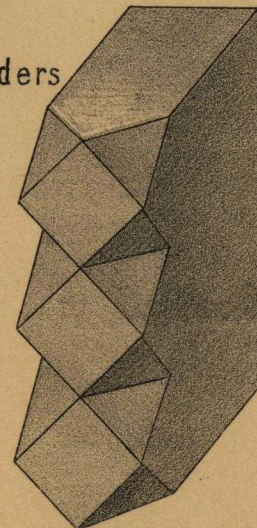
No. 42. Headers.



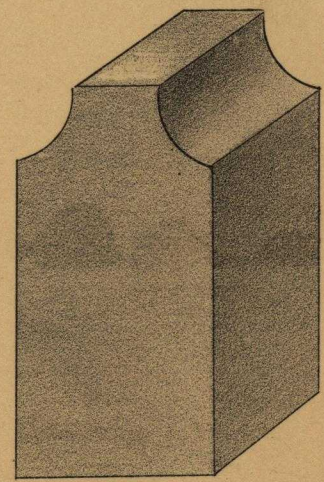
No. 43. Headers.



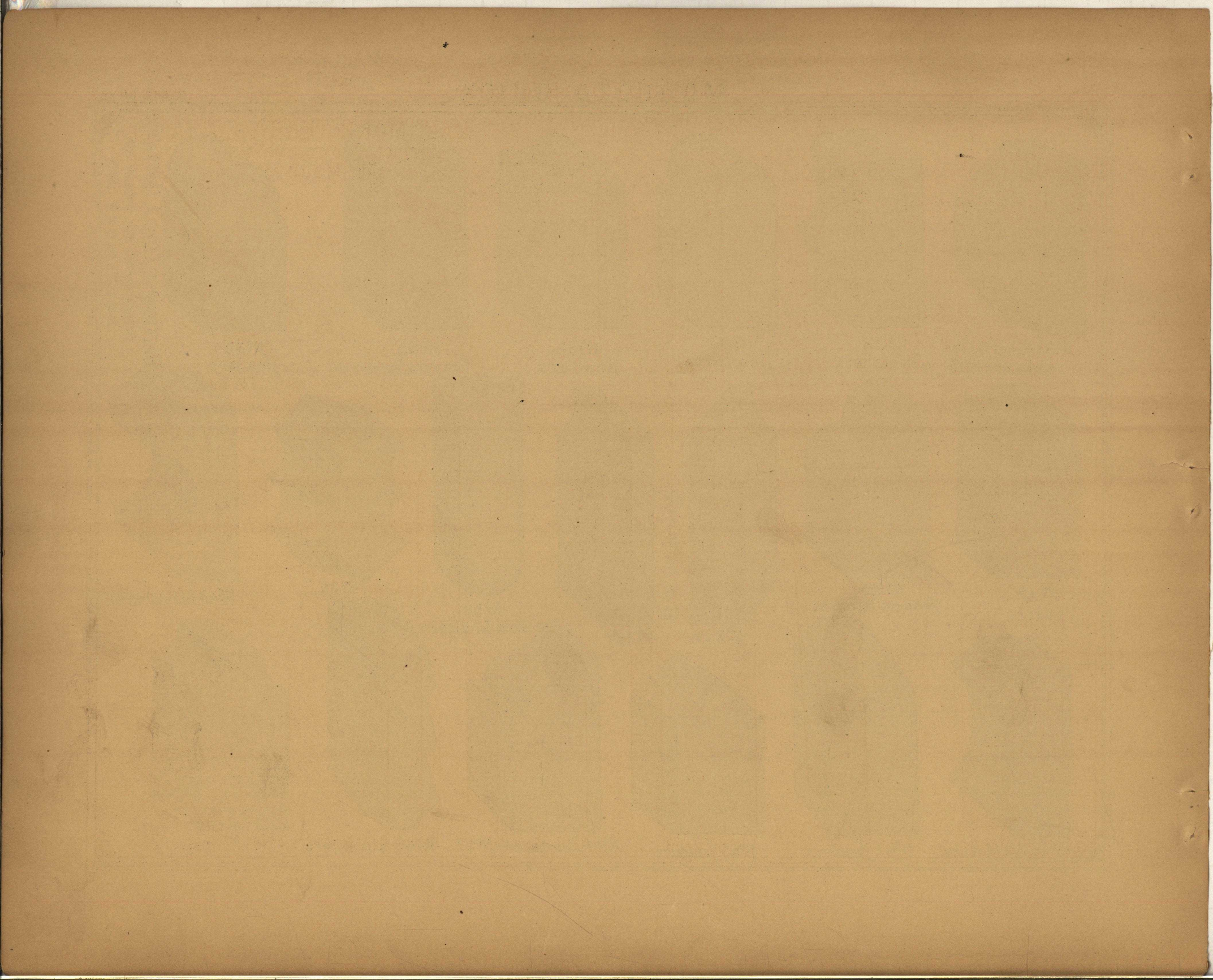
No. 44. Reverses with No. 97.



No. 45. Stretchers.



No. 46. Headers.

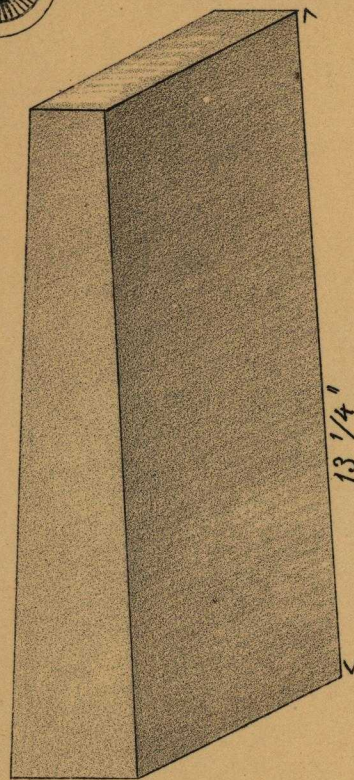


MOULDED BRICK.

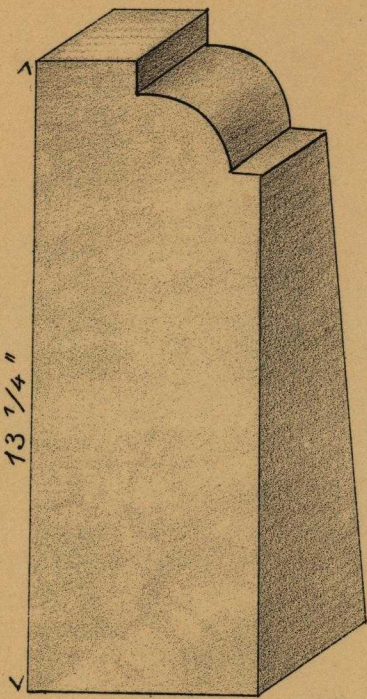
PLATE N^o 22.

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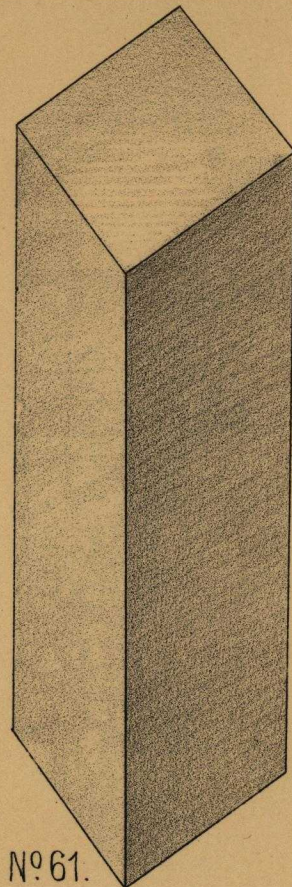
OFFICE, N^o 30 COLUMBIA ST.
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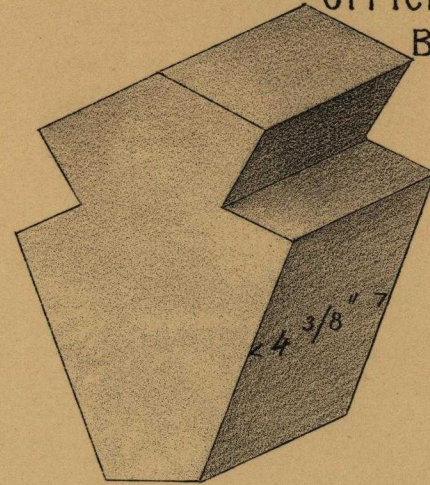
N^o 57. Long Arch.



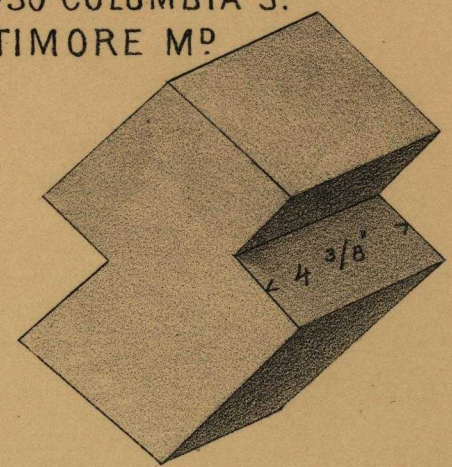
N^o 60. Arch.



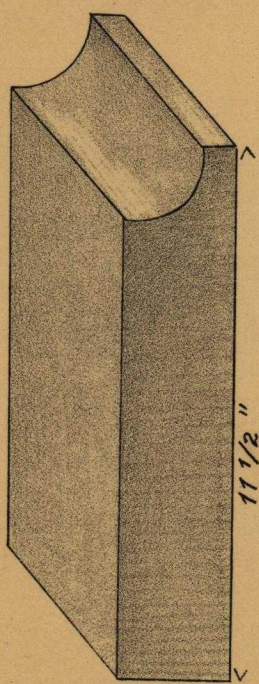
N^o 61.
Square Brick.
12" Long $4\frac{3}{8}$ " wide $4\frac{3}{8}$ " thick.



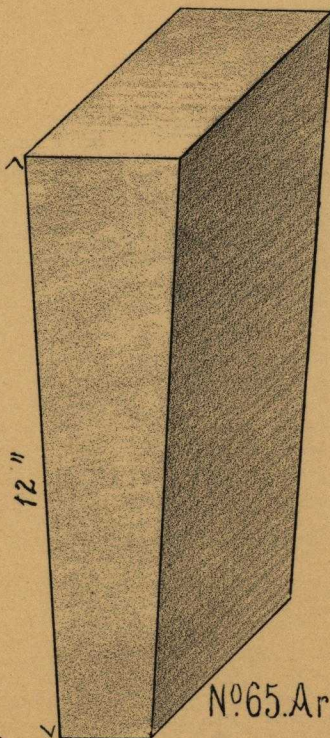
N^o 62. Key Brick.



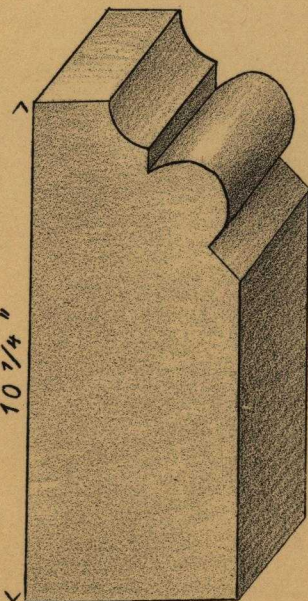
N^o 63. Dentil.



N^o 64. Headers.



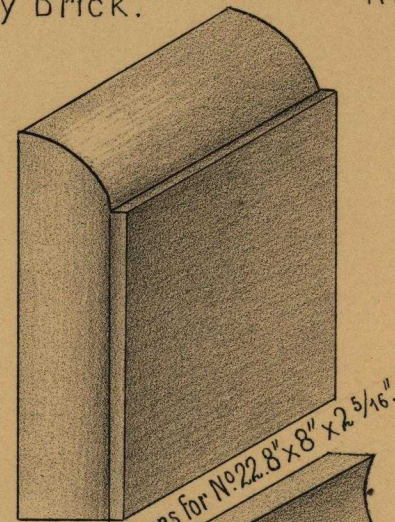
N^o 65. Arch.



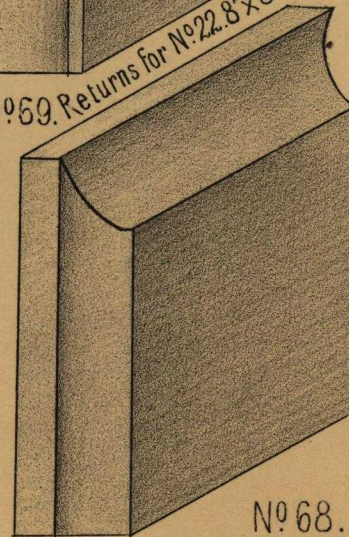
N^o 66. Headers.



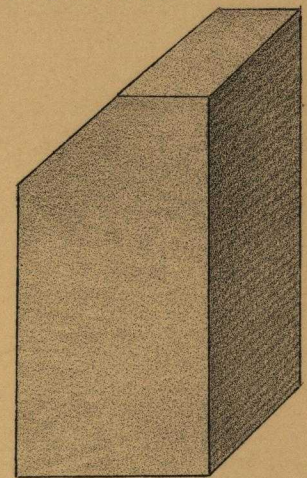
N^o 67. Plain Press.



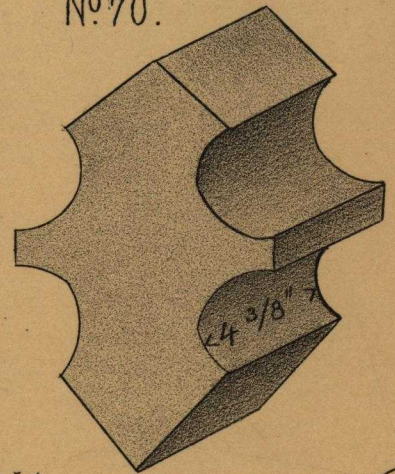
N^o 69. Returns for N^o 22 $8\frac{8}{8} \times 8 \times 2\frac{5}{16}$."



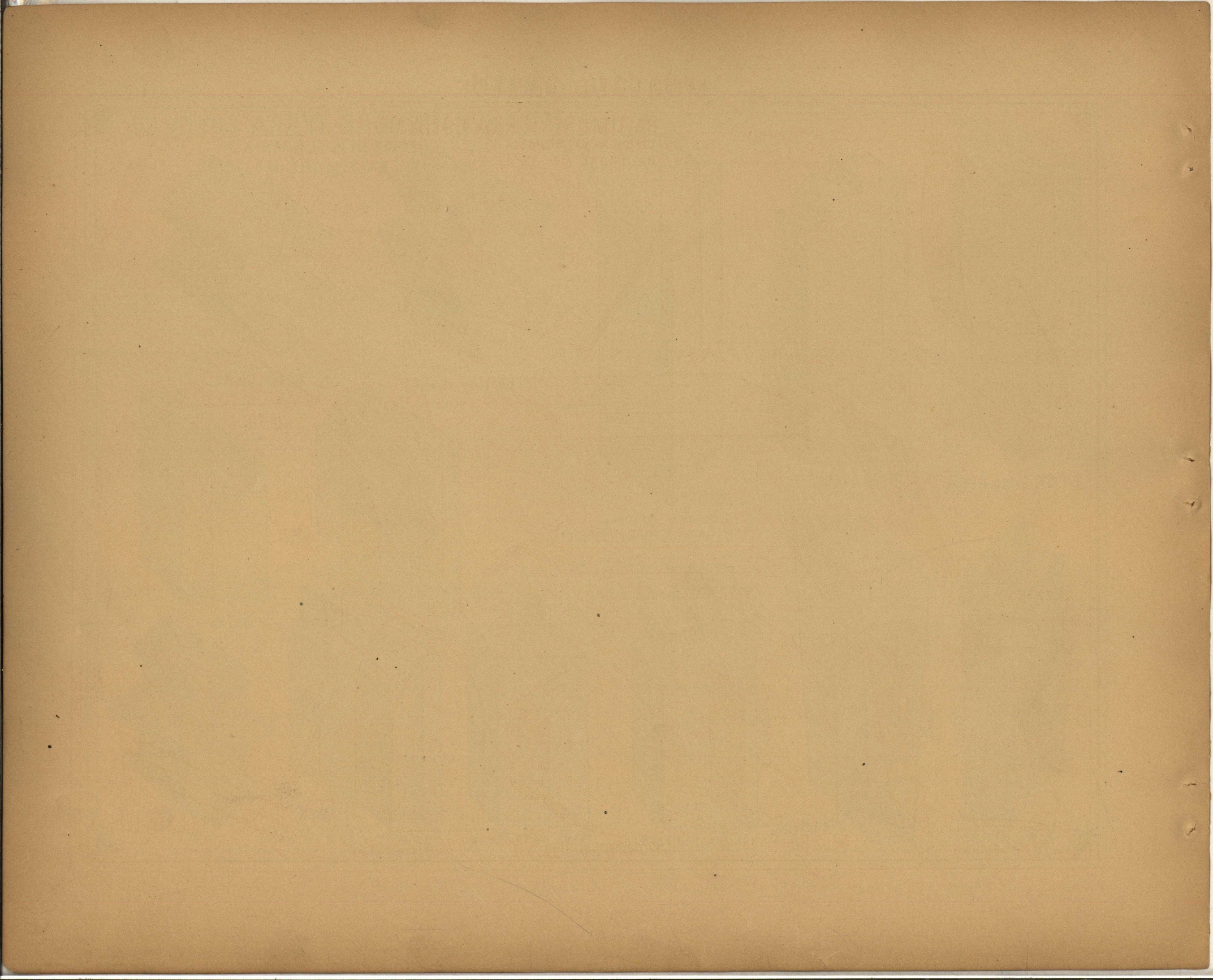
N^o 68.
Returns for N^o 29 $8\frac{8}{8} \times 8 \times 2\frac{5}{16}$."



N^o 70.



N^o 71.

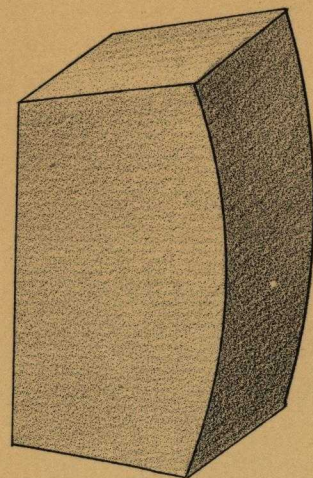


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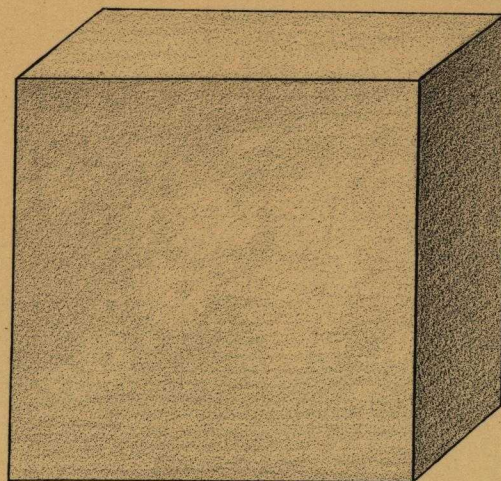
PLATE No 23.

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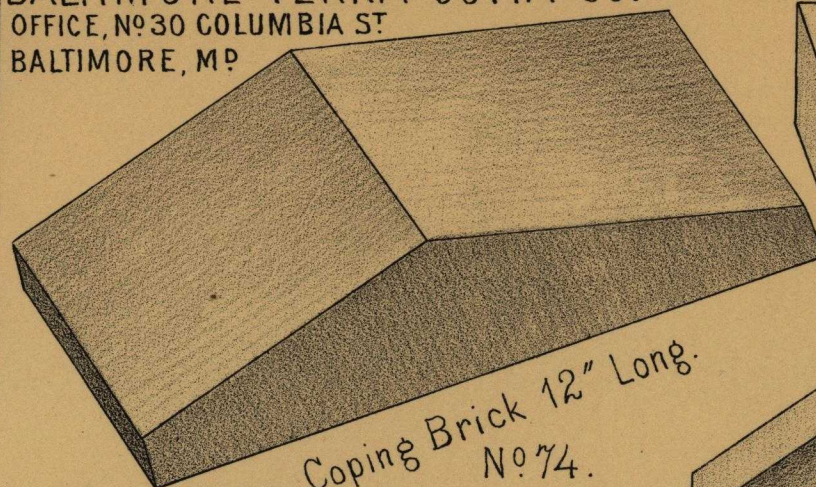
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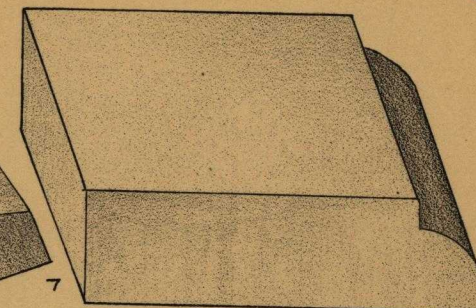
No. 72. Circular.



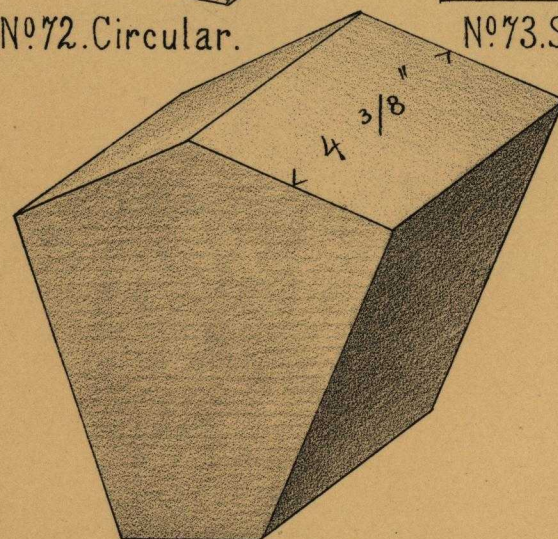
No. 73. Square Brick 8"x8"x2 5/16.



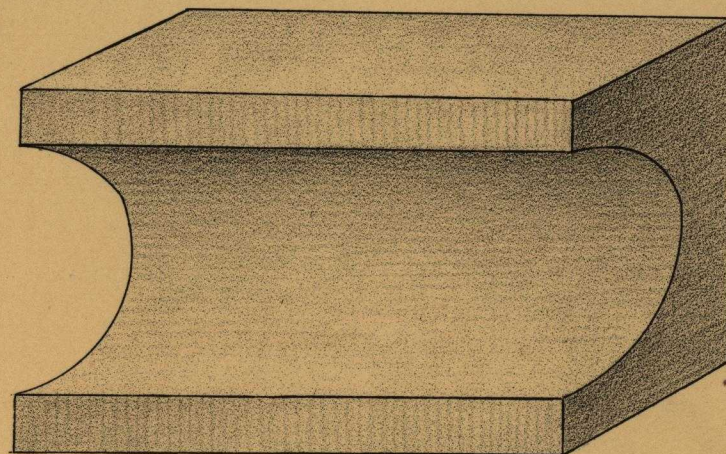
Coping Brick 12" Long.
No. 74.



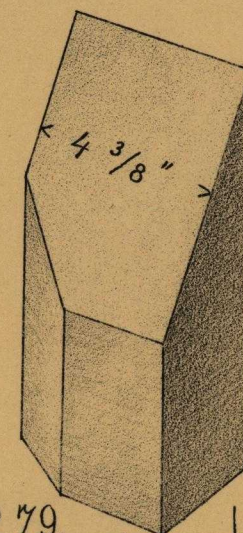
No. 75. Headers.



No. 77. Key Brick.

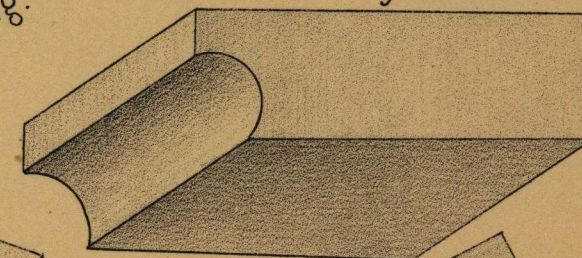


No. 78. Gutter 12" Long.



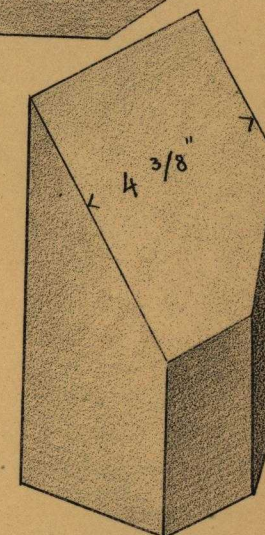
No. 79.

Left.

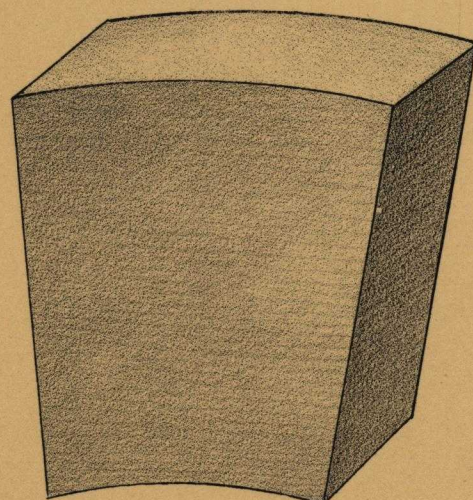


No. 76.

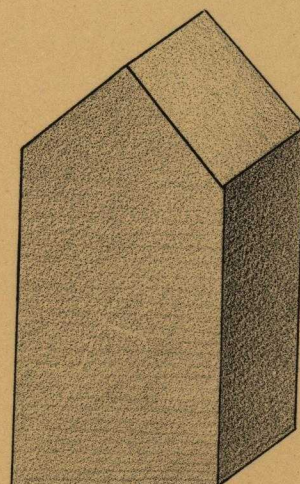
Mitres for
No. 70.



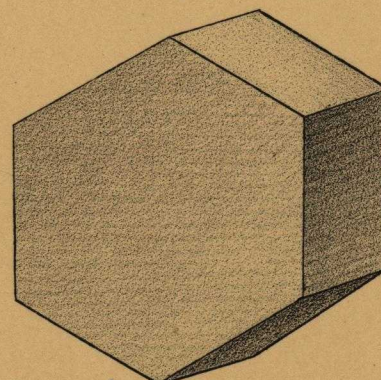
No. 79. Right.



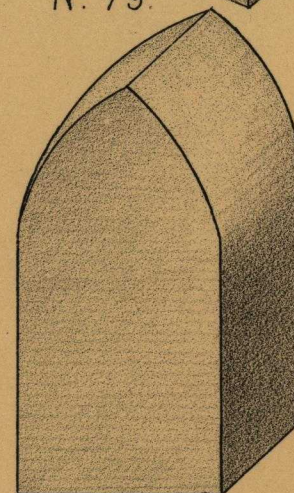
No. 80. Chimney Brick.



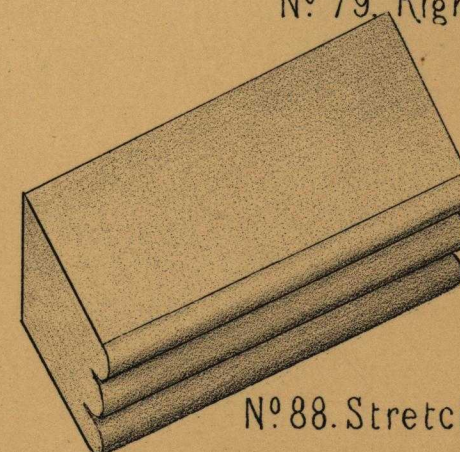
No. 82. Bay Window.



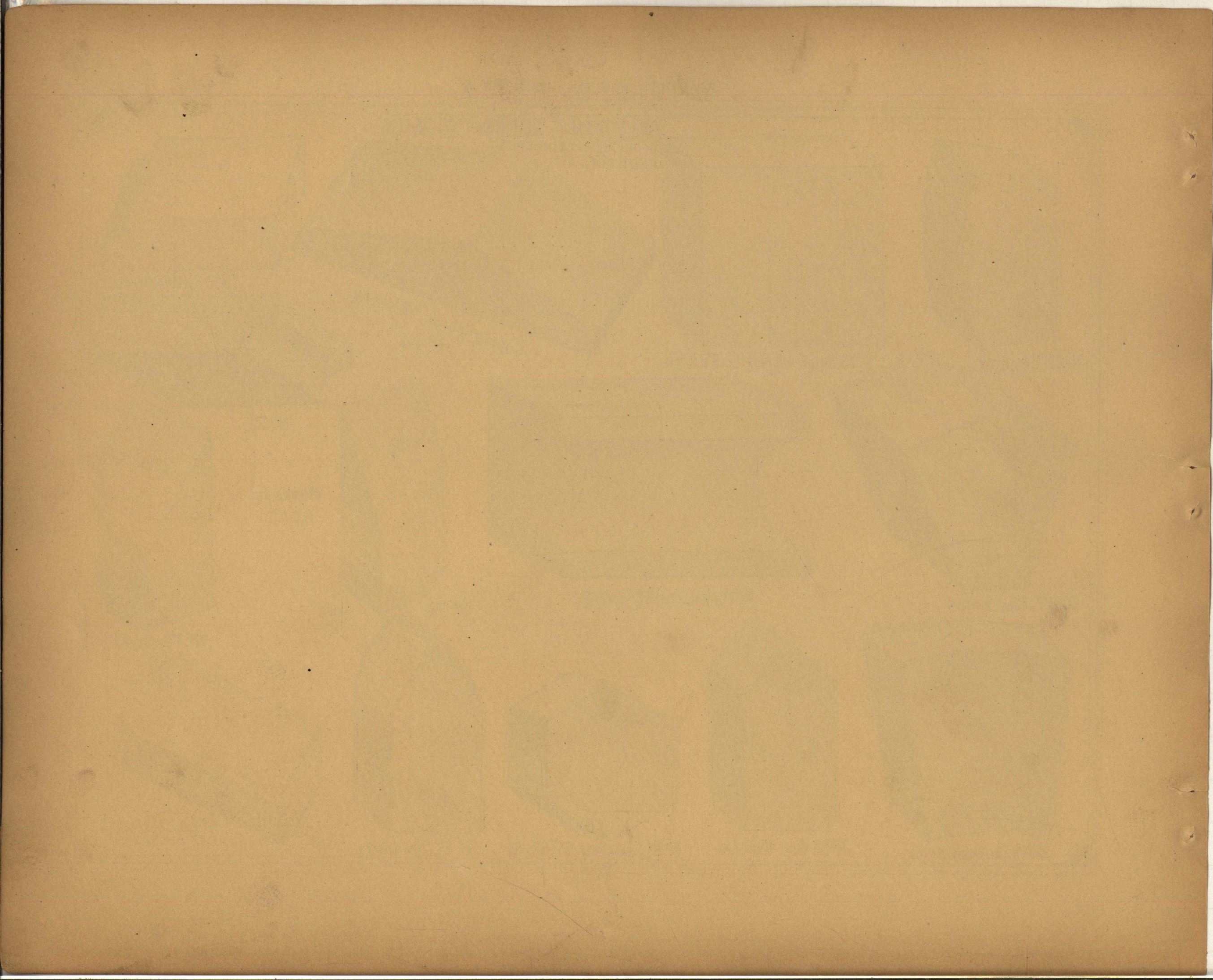
No. 85. Hexagonal Tile 6"x6".



No. 86. Headers.



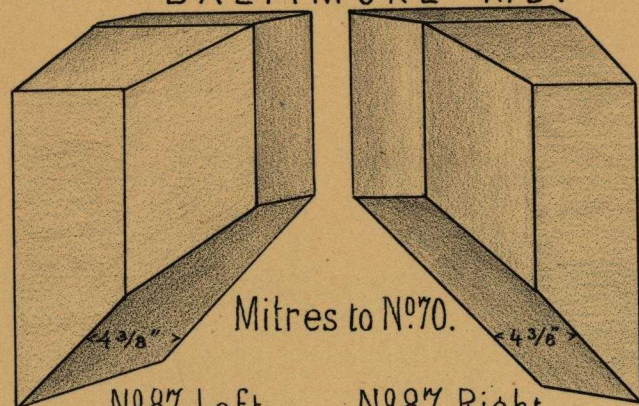
No. 88. Stretchers



MOULDED BRICK.

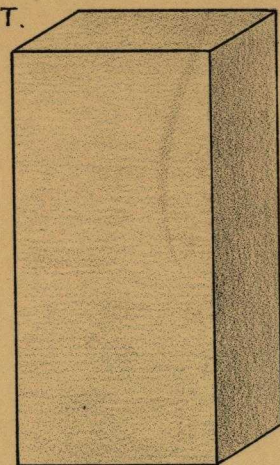
PLATE N° 24.

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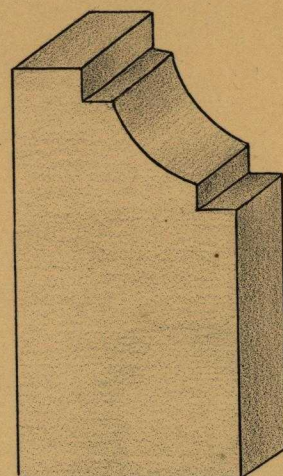


N°87. Left.

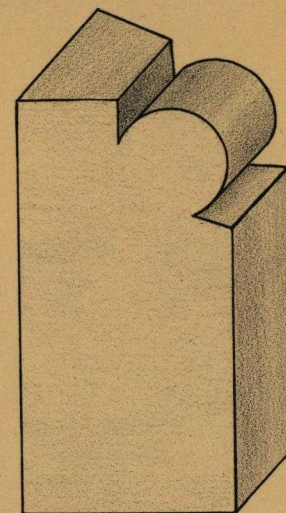
N°87. Right



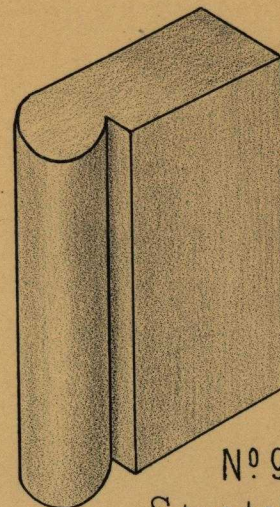
N°90. 1 1/2 in Thick
Press.



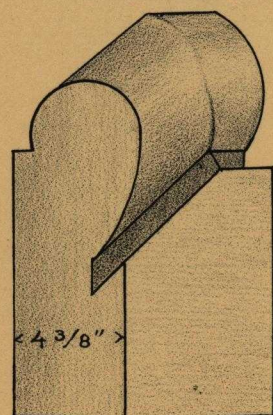
N°94. Head Arch.



N°95. Head Arch.

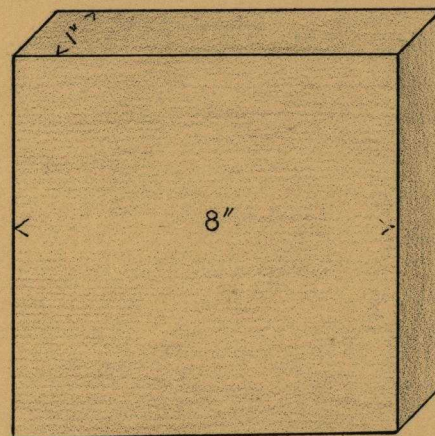
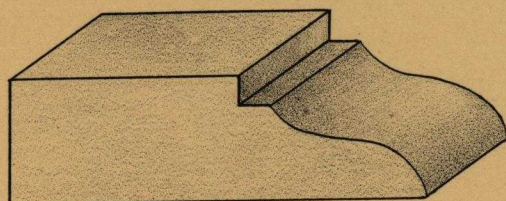


N°96.
Stretchers.



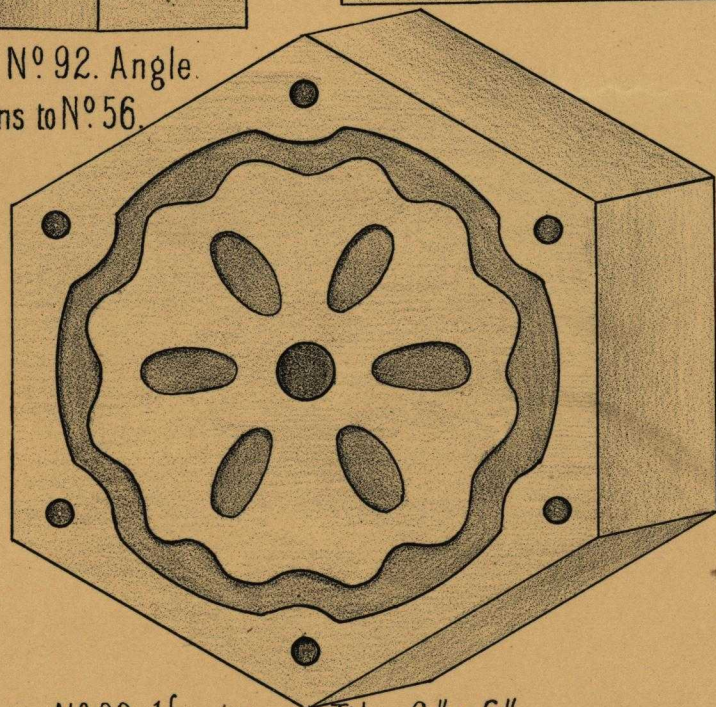
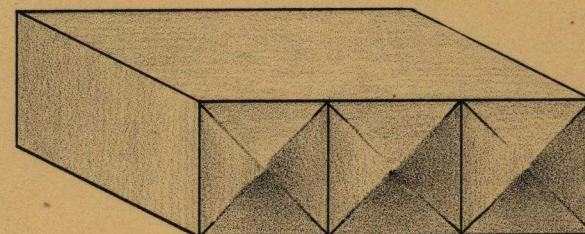
N°92. Angle
Returns to N°56.

N°97. Reverses with N°44.

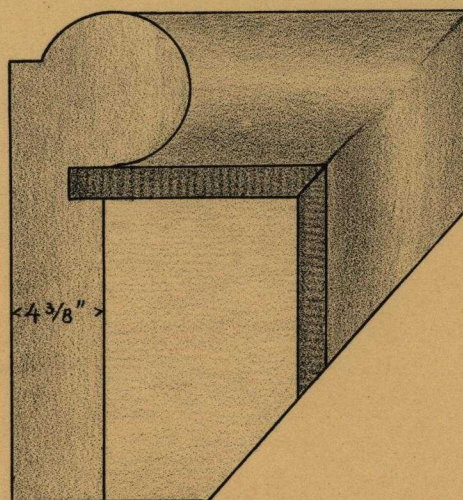


N°50. Roofing Tile 8" x 8".

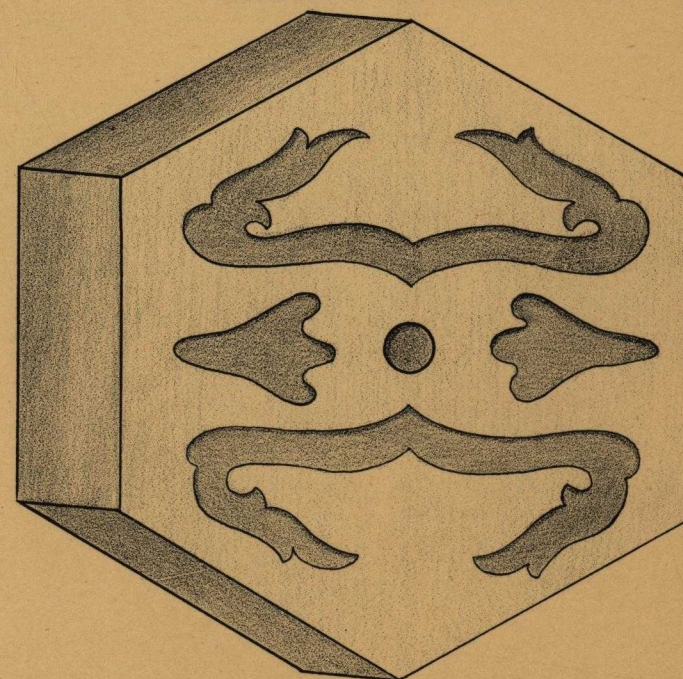
N°98. Stretchers.



N°83. Hexagonal Tile 6" x 6".



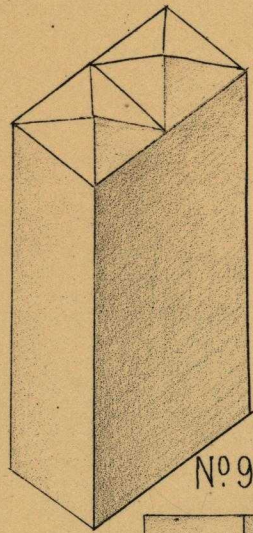
N°91. Angle Returns to N°56.



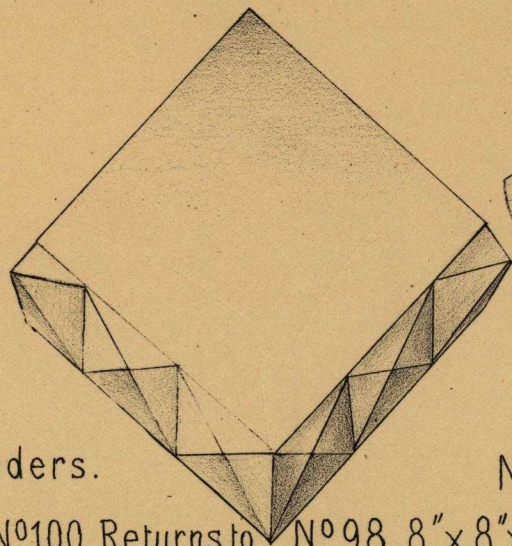
N°84. Hexagonal Tile 6" x 6".

MOULDED BRICK.

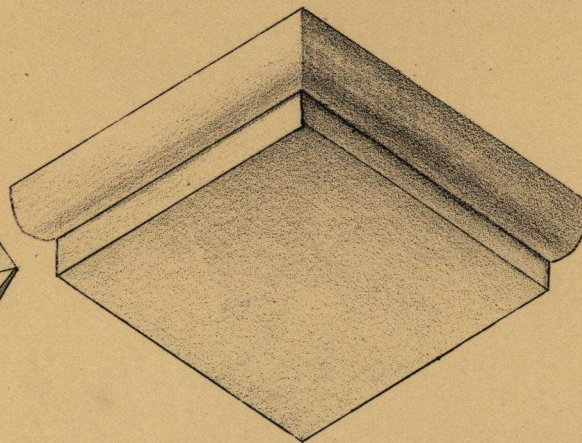
PLATE NO 25.



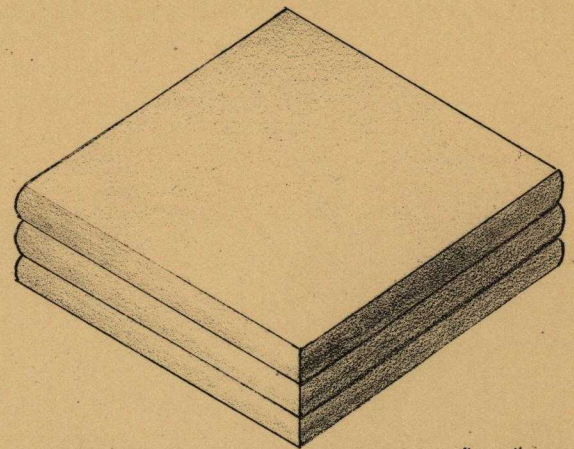
No. 99. Headers.



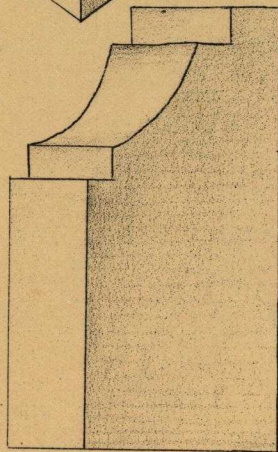
No. 100. Returns to No. 98. $8'' \times 8'' \times 2 \frac{5}{16}''$.



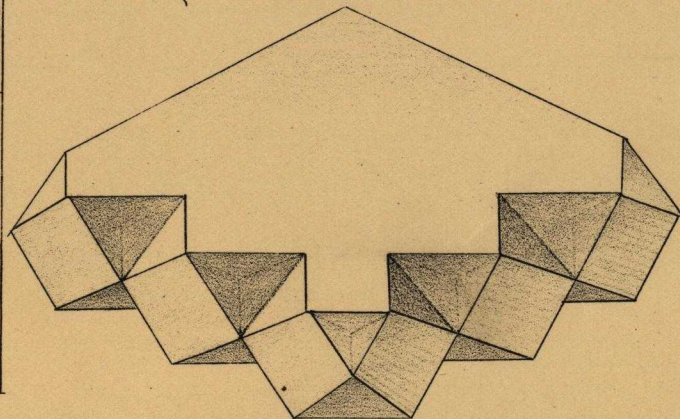
No. 101. Returns to No. 96. $8'' \times 8'' \times 2 \frac{5}{16}''$.



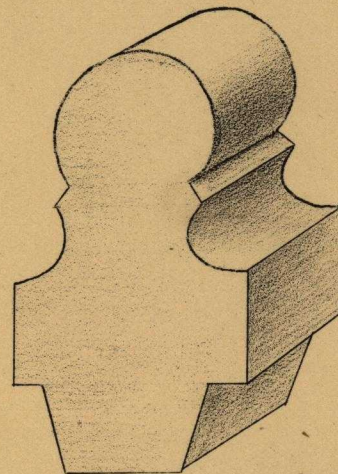
No. 102. Returns to No. 88. $8'' \times 8'' \times 2 \frac{5}{16}''$.



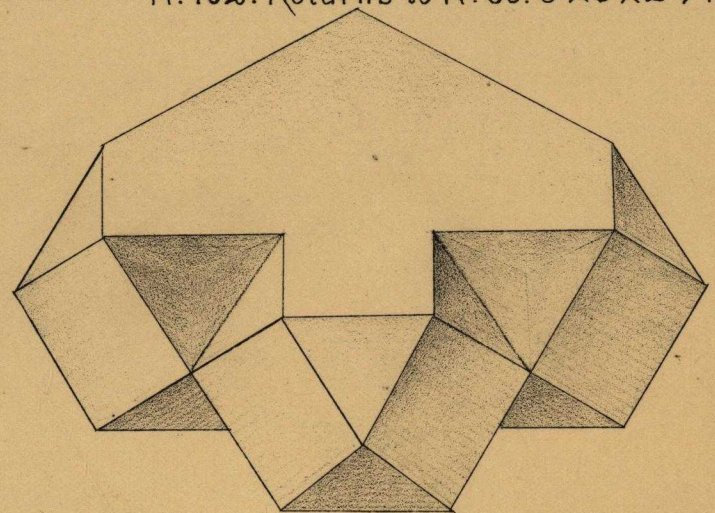
No. 103. Reverses for Jambs.



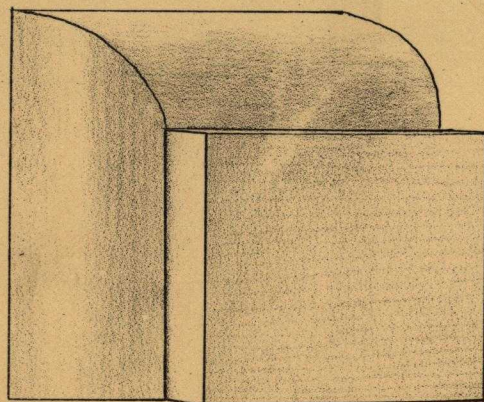
No. 104. Returns to No. 45. $8'' \times 8'' \times 2 \frac{5}{16}''$.



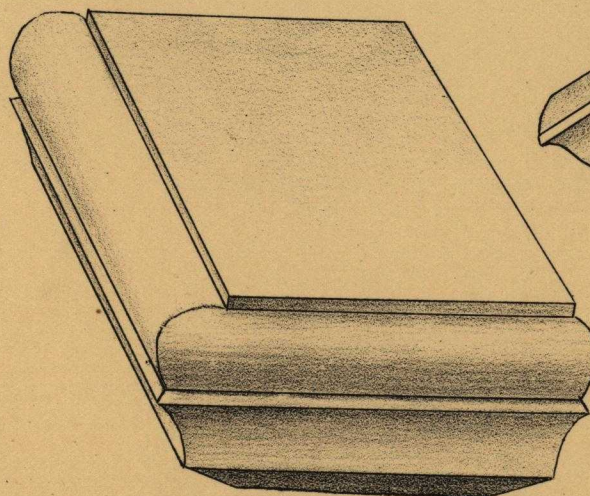
No. 54



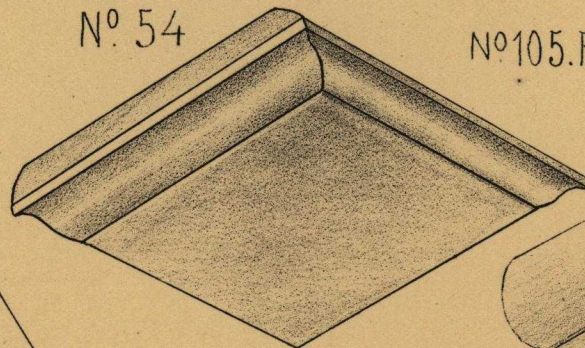
No. 105. Returns to No. 30. $8'' \times 8'' \times 4 \frac{3}{8}''$.



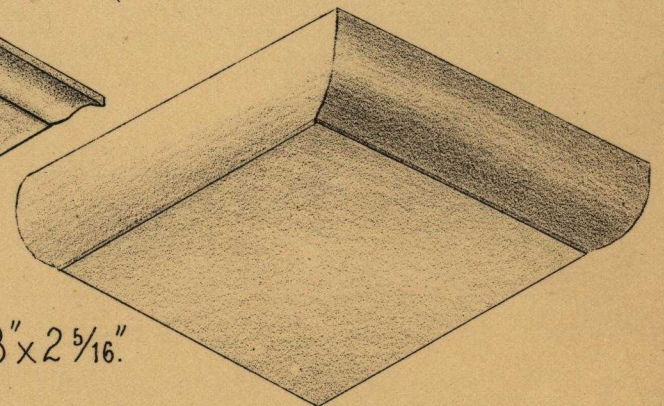
No. 108. Returns to No. 16. $8'' \times 8'' \times 4 \frac{3}{8}''$.



No. 109. Returns to No. 37. $8'' \times 8'' \times 4 \frac{3}{8}''$.



No. 107. Returns to No. 24. $8'' \times 8'' \times 2 \frac{5}{16}''$.

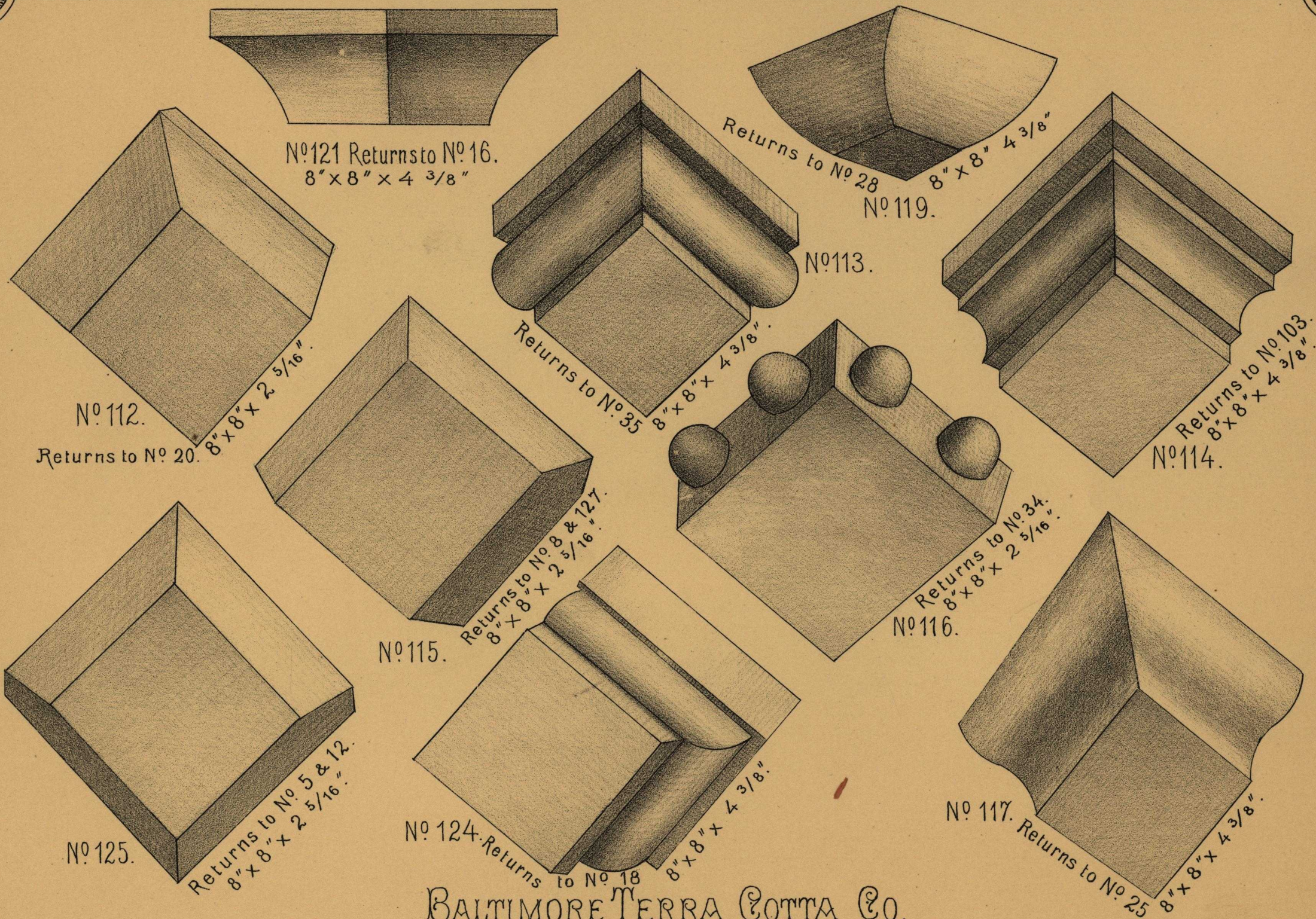


No. 106. Returns to No. 13. $8'' \times 8'' \times 2 \frac{5}{16}''$.

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RETURN MOULDED BRICK.

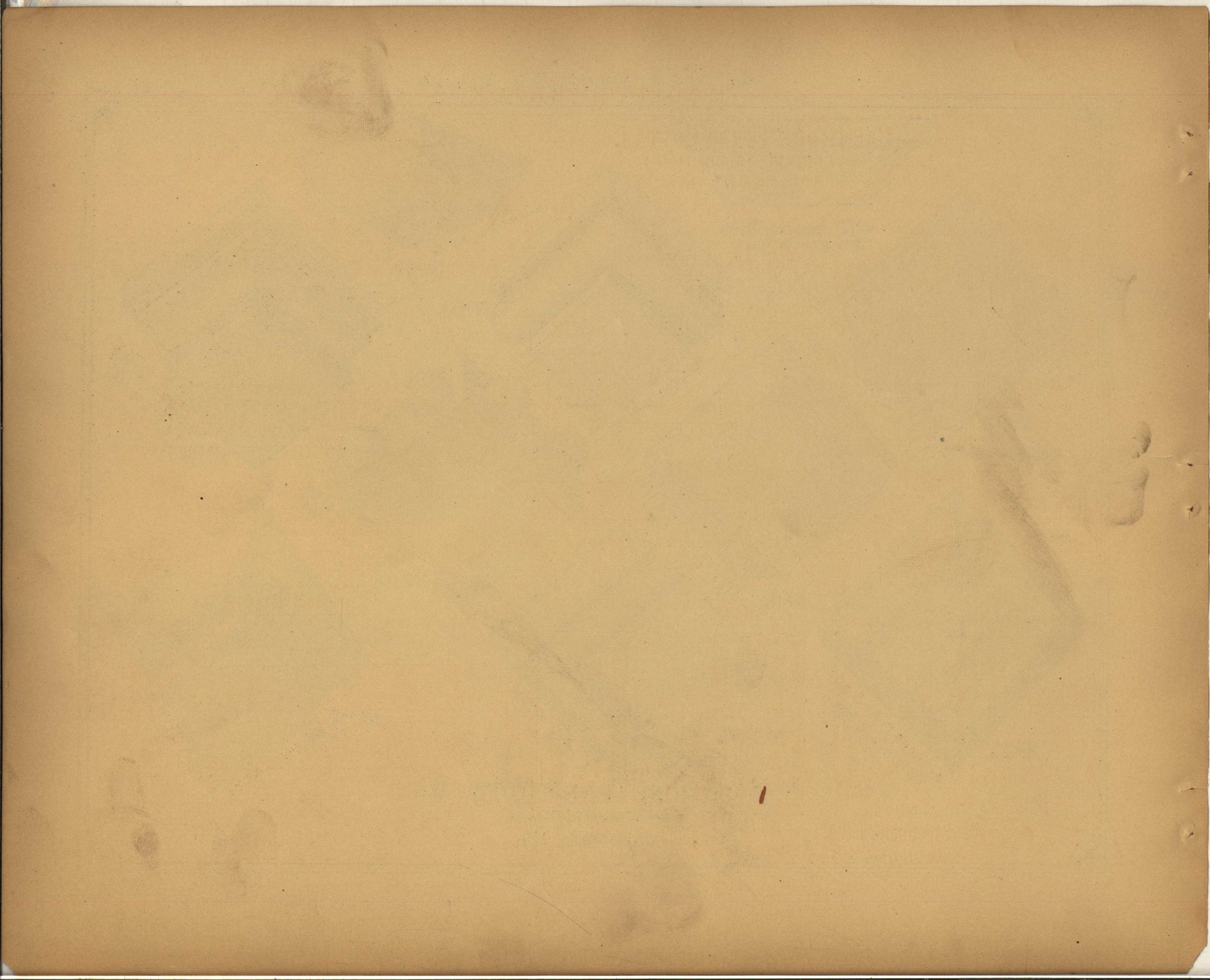
PLATE Nº 26.



BALTIMORE TERRA COTTA CO.

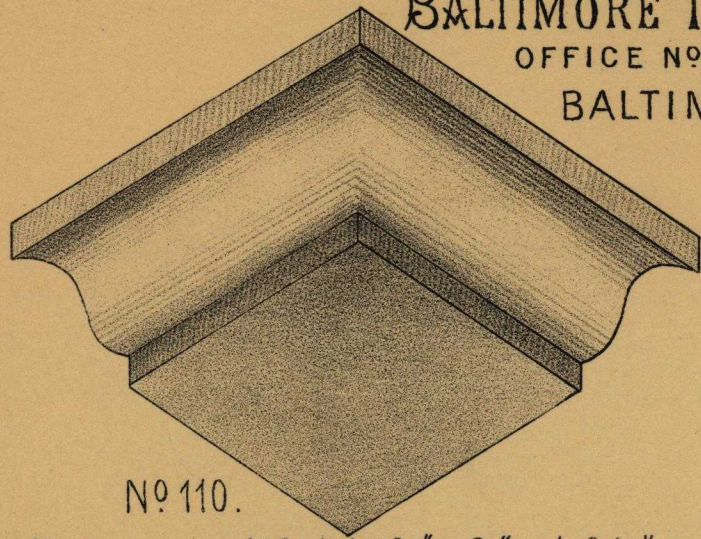
OFFICE Nº 30 COLUMBIA ST.

BALTIMORE MD.

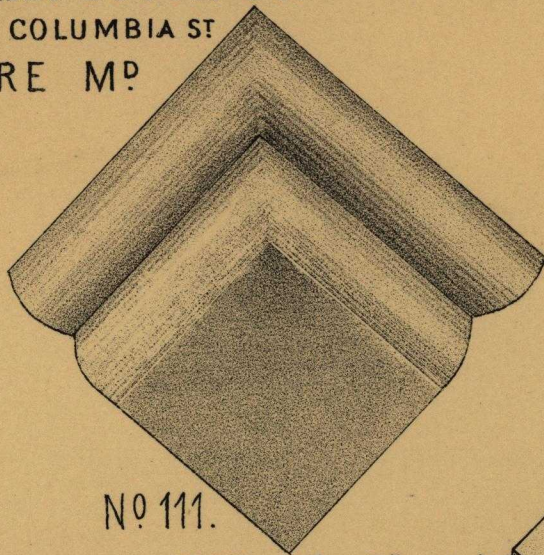


BALTIMORE TERRA COTTA CO.

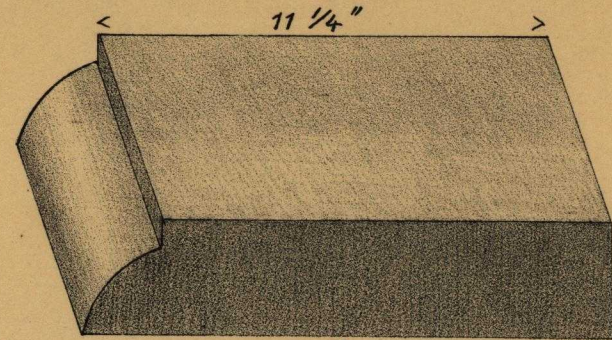
OFFICE NO 30 COLUMBIA ST
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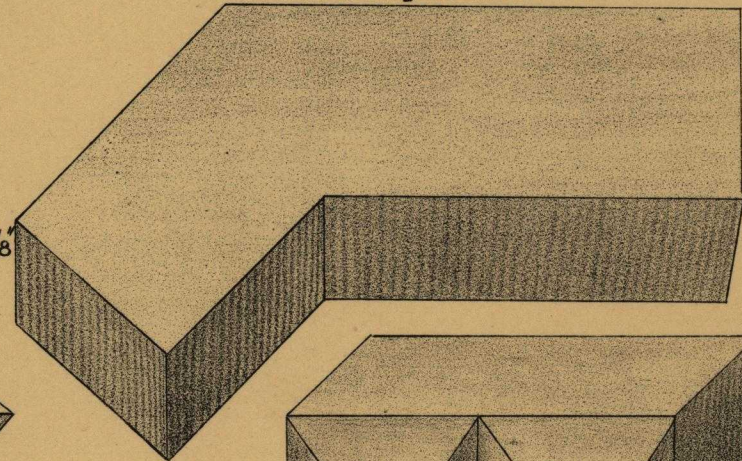
No 110.
Returns to No 44. 8" x 8" x 4 3/8".



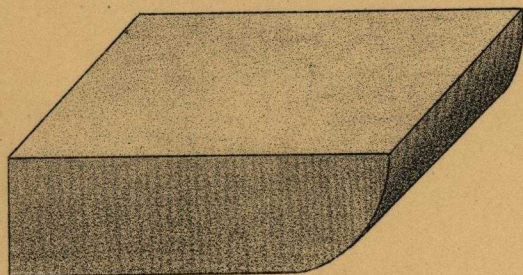
No 111.
Returns to No 38. 8" x 8" x 4 3/8".



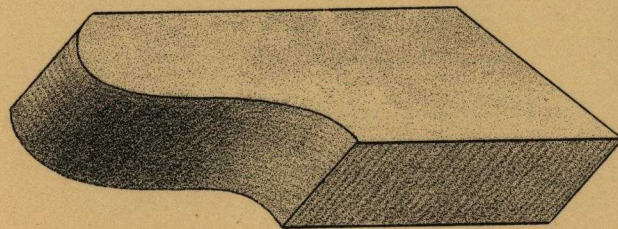
No 59. Headers.



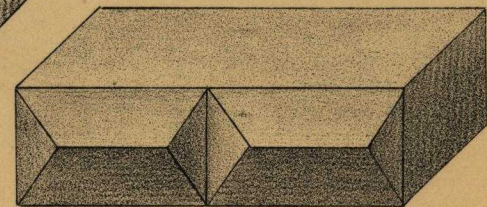
No 55.
Return
Corners
16" long.



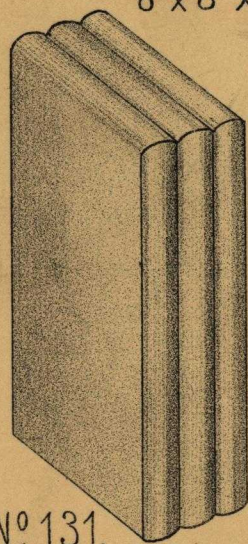
No 128. Stretchers & Returns 4" x 8".
8" x 8" x 2 5/16".



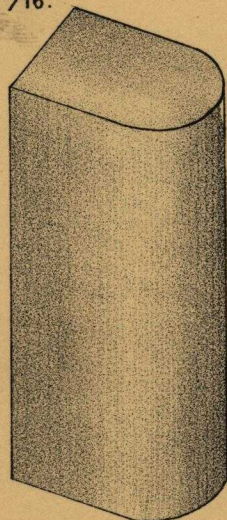
No 129. Headers & Returns 8" x 8" x 4 3/8".



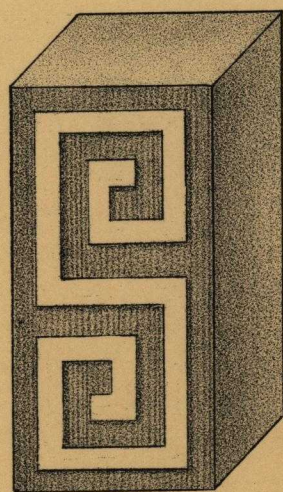
No 130. Stretchers with 8" x 8" Returns.



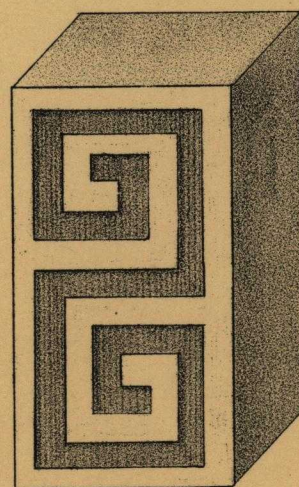
No 131.
Returns to No 88.
4" x 8".



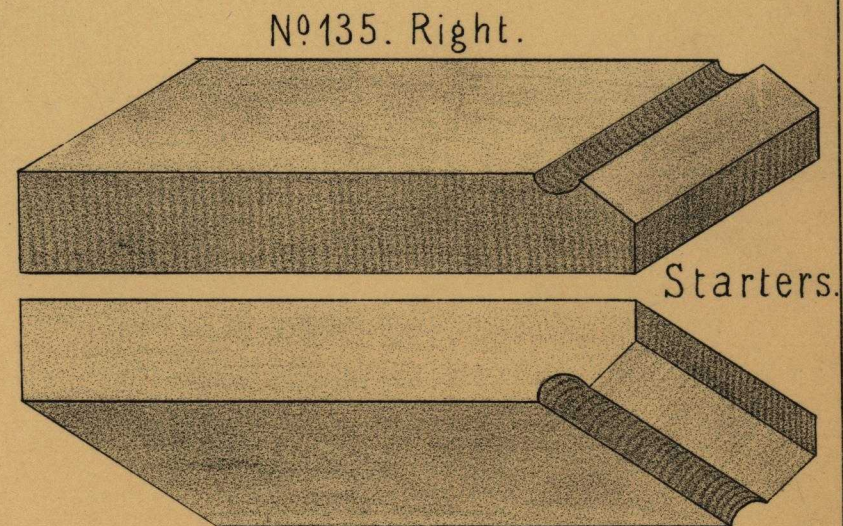
No 132.
Stretchers to No 13.
Returns 4" x 8".



No 133.
Returns to 8" by 8".



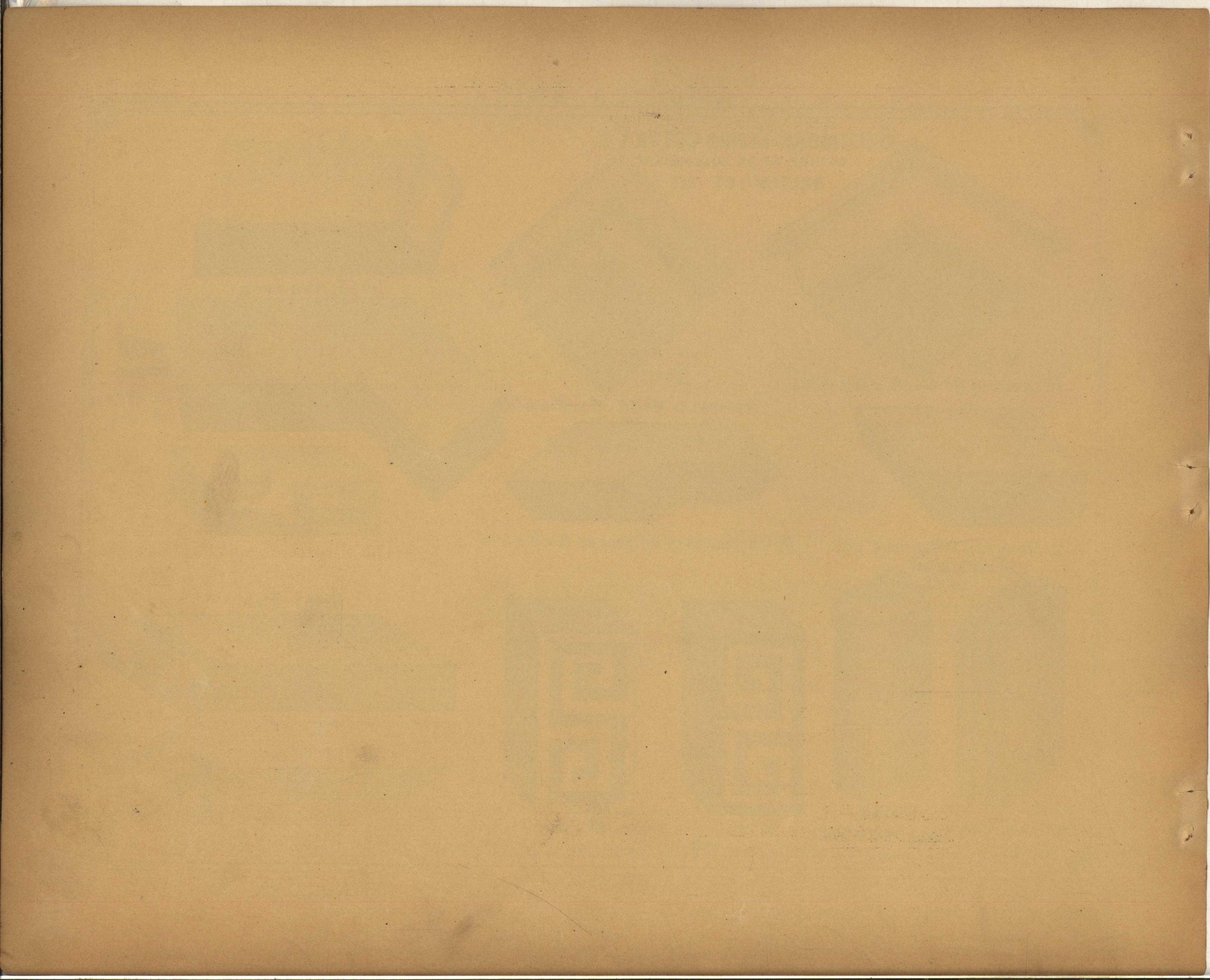
No 134.
Returns to 8" by 8".



No 135. Right.

No 135. Left.

Starters.



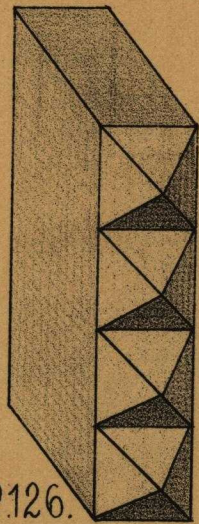
MOULDED BRICK.

PLATE N^o 28.

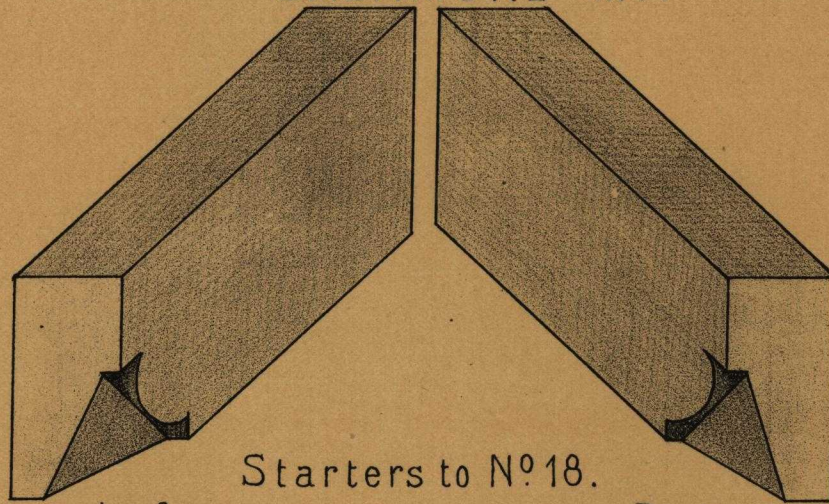
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N^o 127.
Stretchers &
Returns, 4"x8".



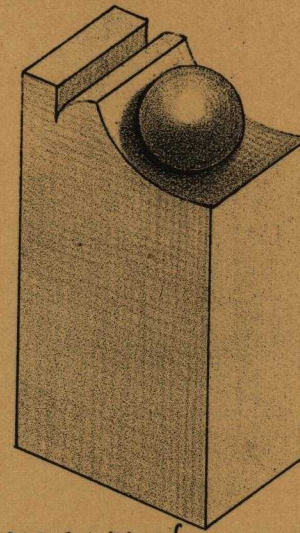
N^o 126.
Headers, Stretchers &
Returns, 8"x8"x2 5/16".



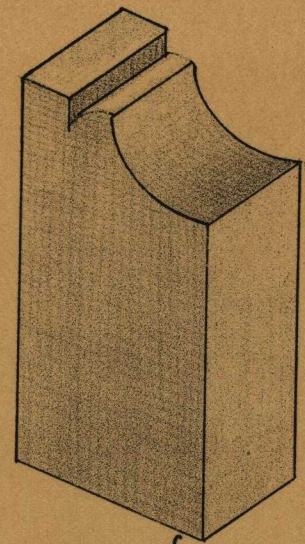
Starters to N^o 18.

Left.

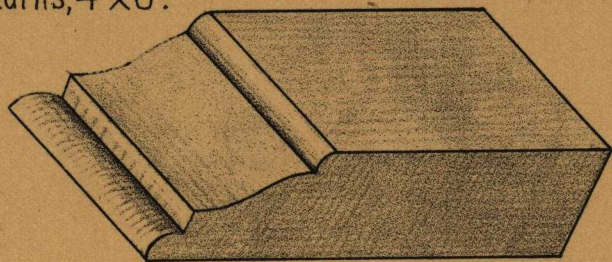
Right.



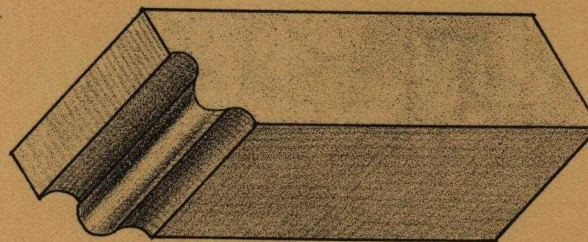
N^o 147. Headers
8"x8"x4 3/8" Returns.



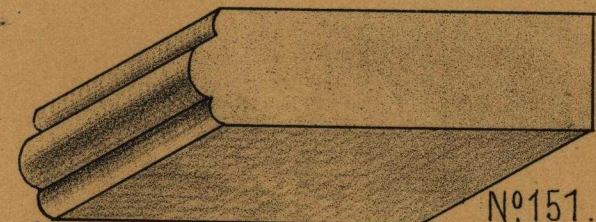
N^o 148. Headers
8"x8"x4 3/8" Returns.



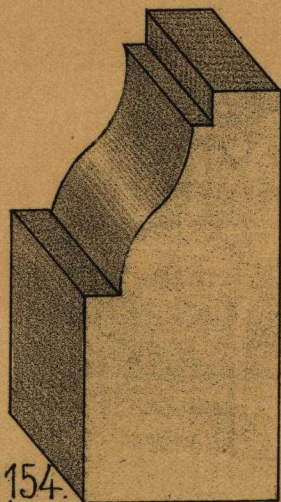
N^o 149. Headers, Stretchers & Returns.
8"x8"x2 5/16".



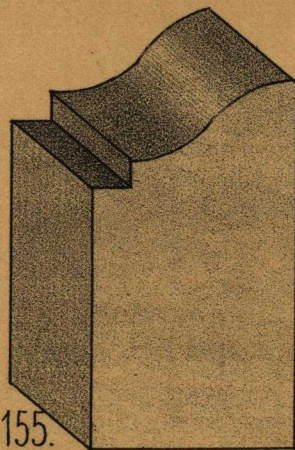
N^o 150. Headers, Stretchers & Returns.
8"x8"x2 5/16" & 4"x8"x2 5/16".



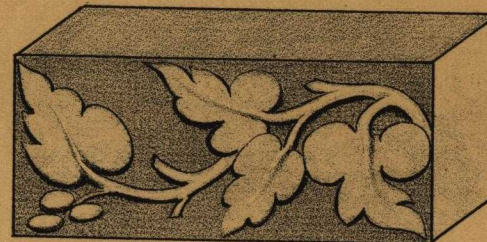
N^o 151.
Headers, Stretchers & Returns.
8"x8"x2 5/16" & 4"x8"x2 5/16".



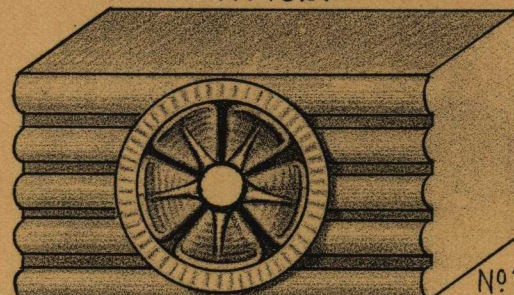
N^o 154.
Headers, Returns, 8"x8"x4 3/8".



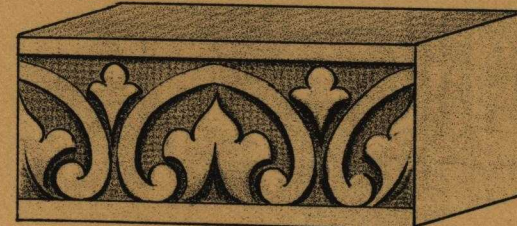
N^o 155.
Headers & Returns, 8"x8"x4 3/8".



N^o 152.



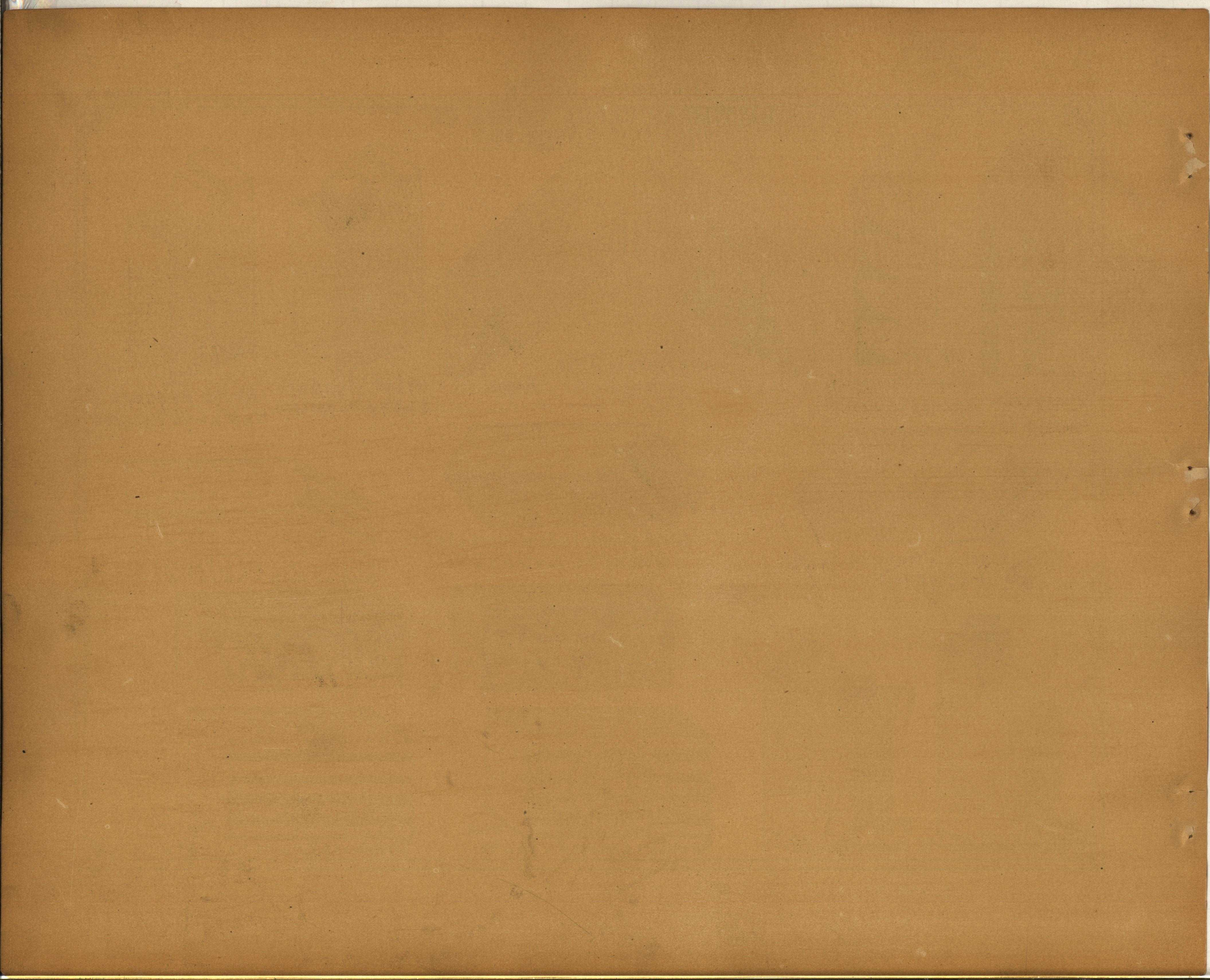
N^o 156.
Stretchers & Returns, 8"x8"x4 3/8".



N^o 153.



N^o 157.
Stretchers & Returns, 8"x8"x4 3/8".

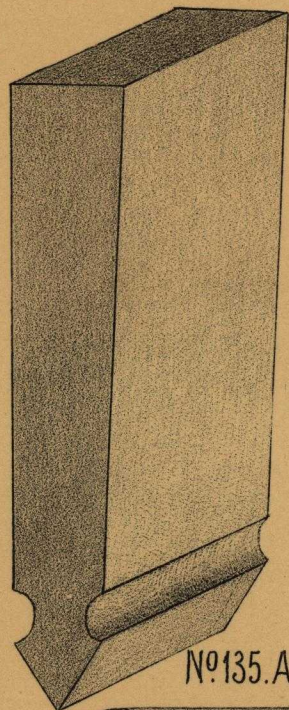


MOULDED BRICK.

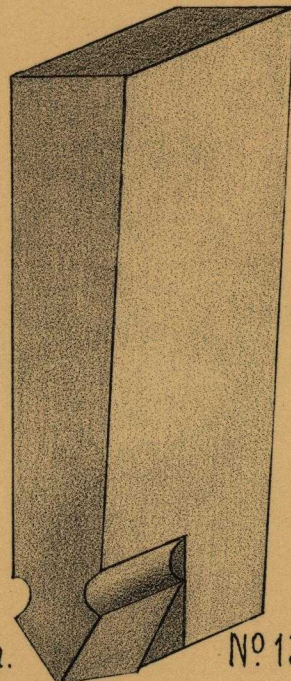
PLATE N^o 29.

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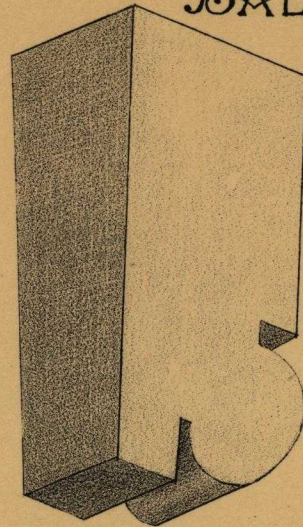
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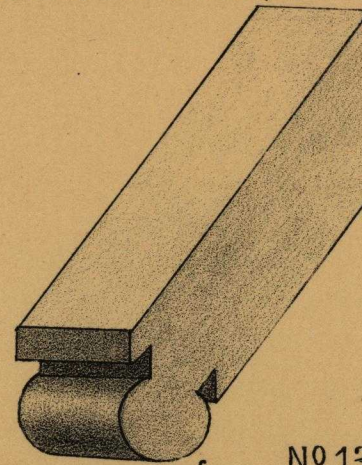
N^o 135. Arch.



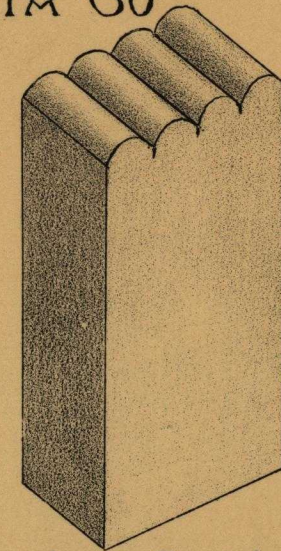
N^o 136. Arch.



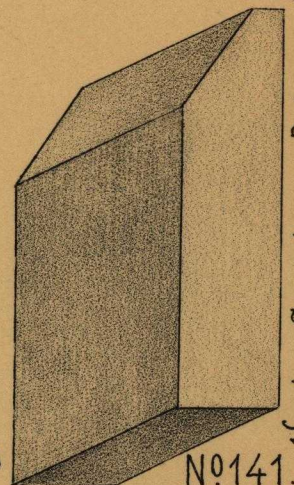
N^o 137. Short Arch.



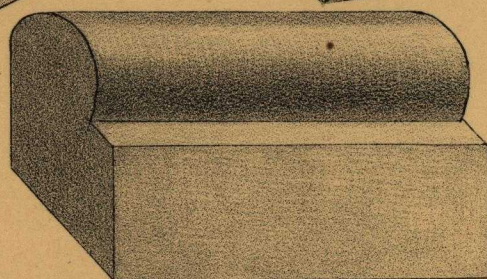
N^o 138. Reverse Headers.



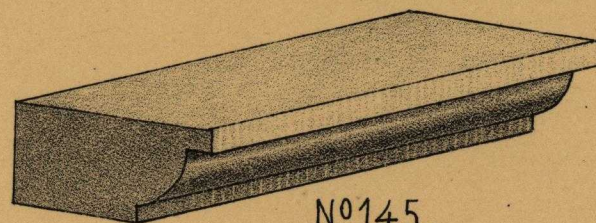
N^o 139 Headers & Stretchers
Returns 8"x8"x2 5/16".



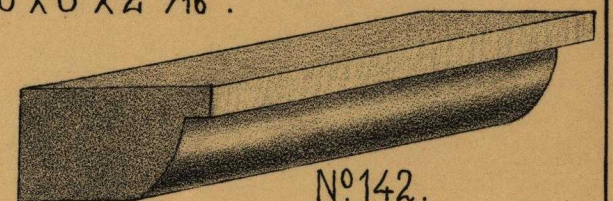
N^o 141.



N^o 140. Stretchers, Headers & Returns,
8"x8"x2 5/16" & 8"x4"x2 5/16."

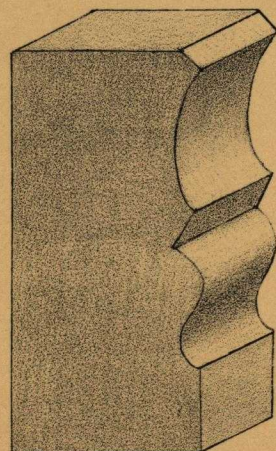


N^o 145.
Stretchers, Headers & Returns,
8"x8"x2 5/16" & 4"x8"x2 5/16."

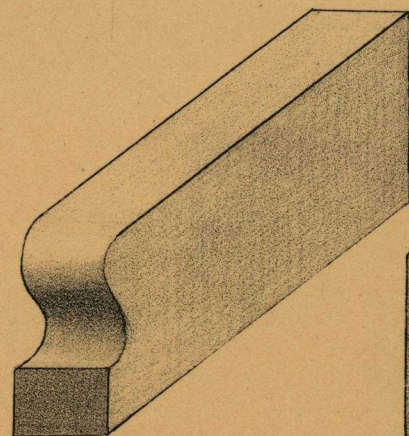


N^o 142.

Stretchers, Headers & Returns.
8"x8"x2 5/16" & 4"x8"x2 5/16."

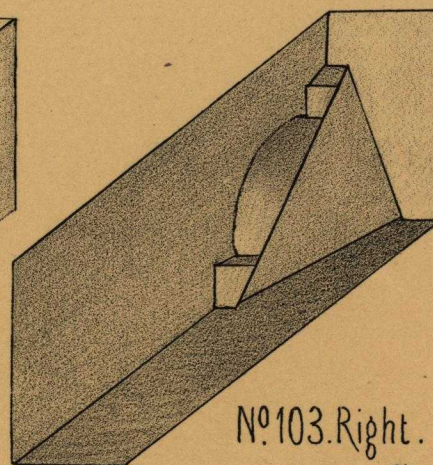


N^o 143. Panel.

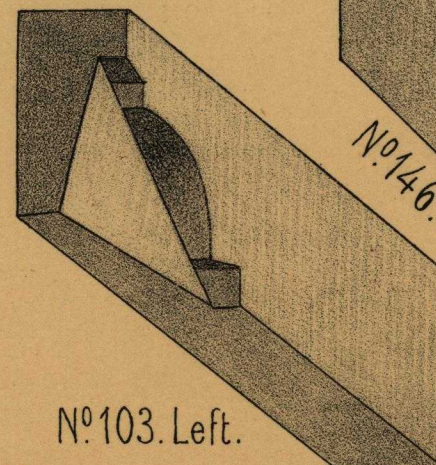


N^o 144.

N^o 143. & N^o 144 work together.

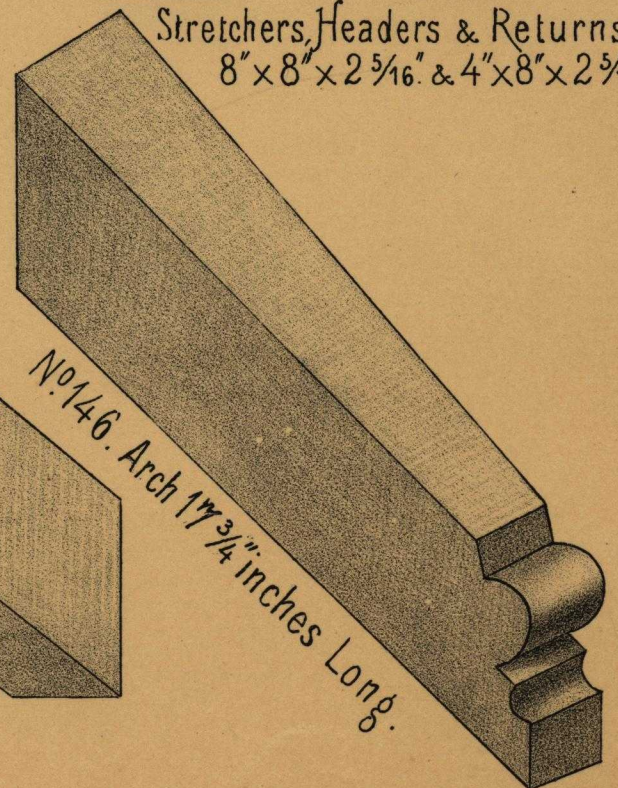


N^o 103. Right.



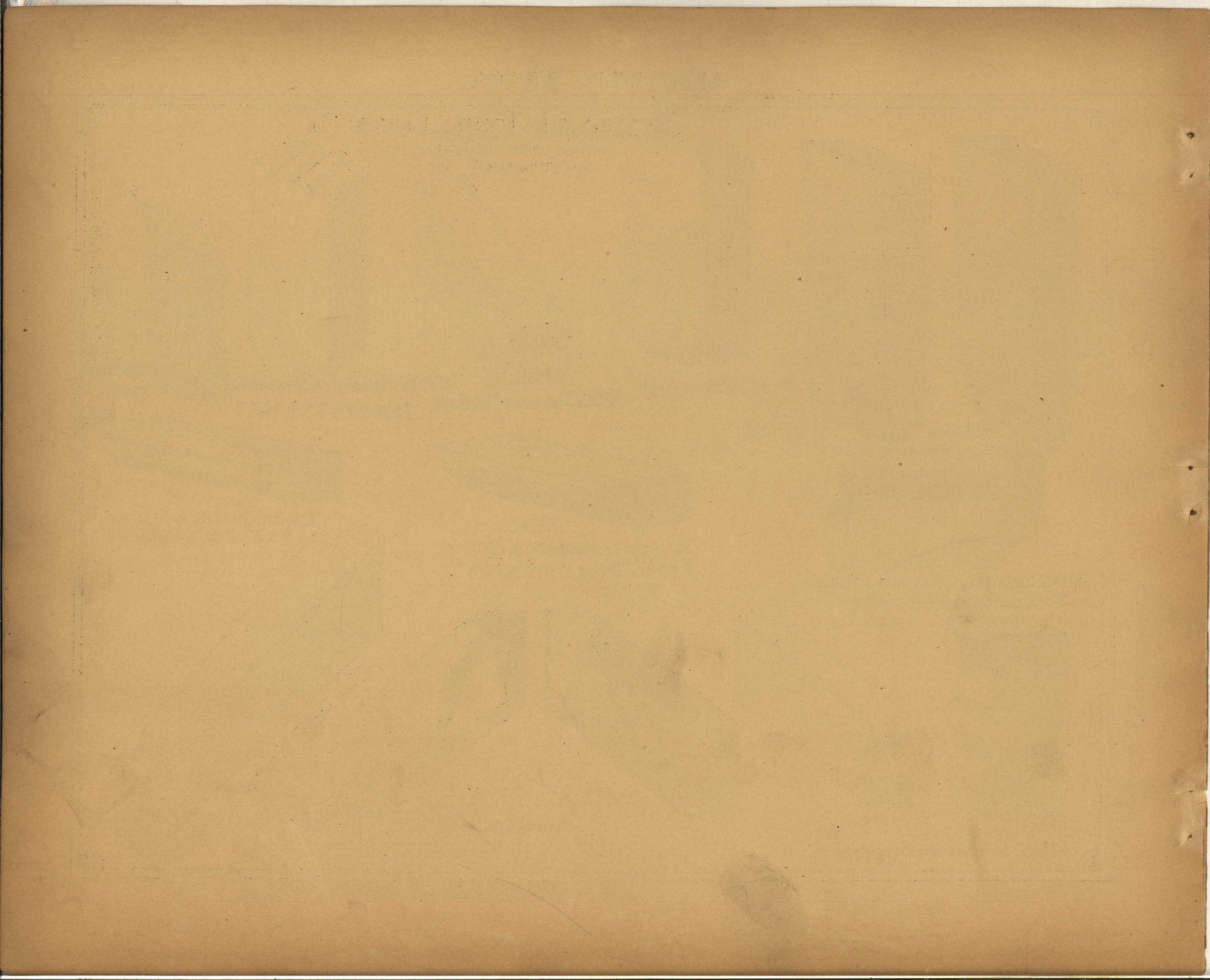
N^o 103. Left.

Starters.



N^o 146. Arch 17 3/4 inches Long.

Headers, Stretchers & Returns, 4"x8"x.



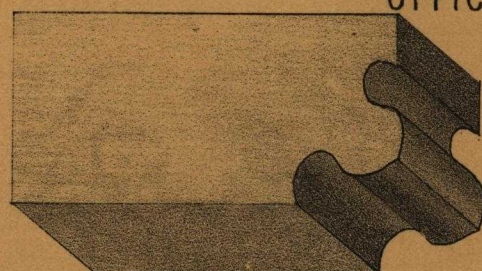
MOULDED BRICK.

PLATE No 30.

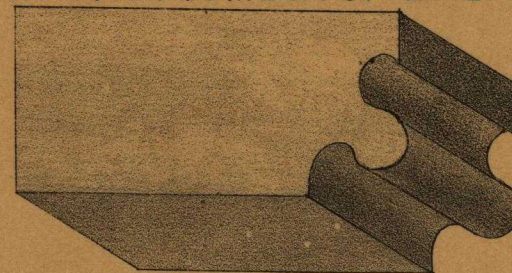
BALTIMORE, TERRA COTTA CO.
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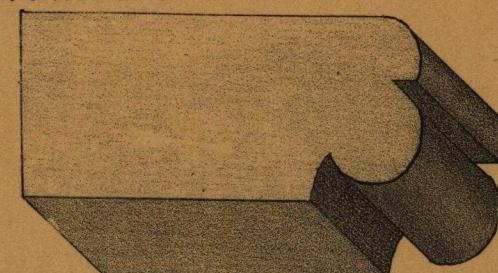
No 158. Headers & Returns,
8"x8"x4 3/8."



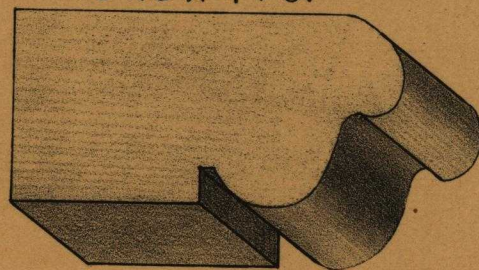
No 159. Headers & Returns,
8"x8"x4 3/8."



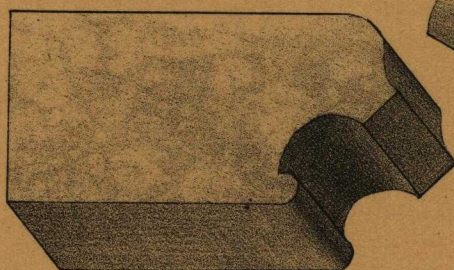
No 160. Headers & Returns,
8"x8"x4 3/8."



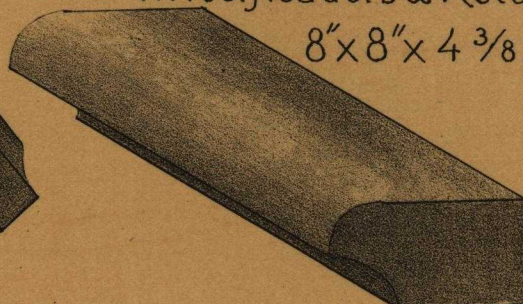
No 161. Headers & Returns,
8"x8"x4 3/8."



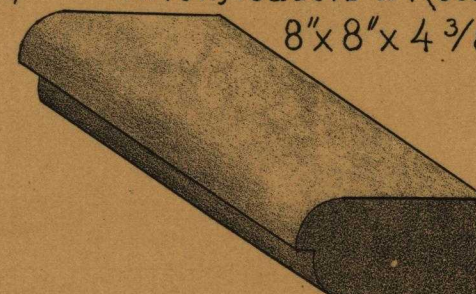
No 162. Headers & Returns,
8"x8"x4 3/8."



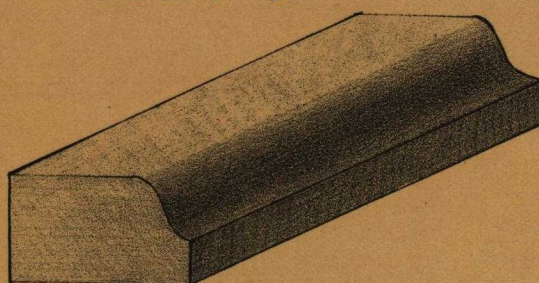
No 163. Headers & Returns,
8"x8"x4 3/8."



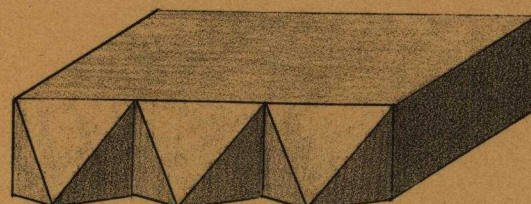
No 164. Stretchers & Returns,
4"x8"x2 5/16."



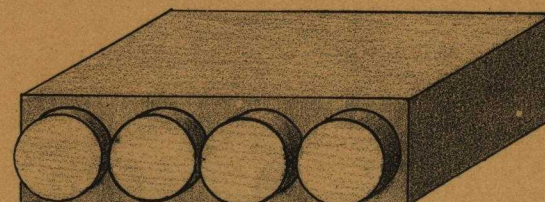
No 165. Stretchers, Headers & Returns,
4"x8"x2 5/16." & 8"x8"x2 5/16."



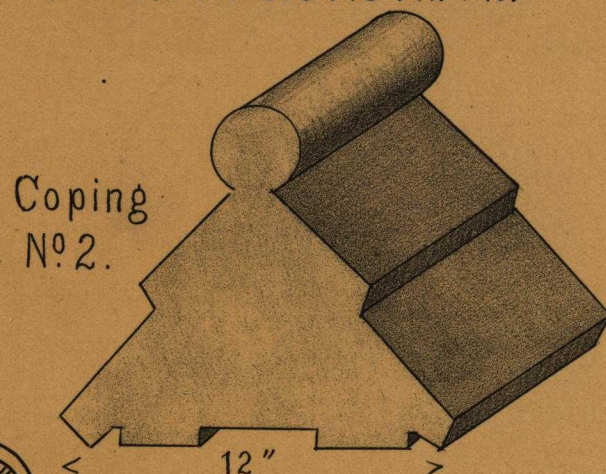
No 165. Stretchers, Headers & Returns,
4"x8"x2 5/16." & 8"x8"x2 5/16."



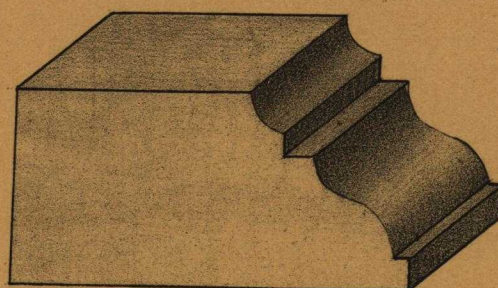
No 166. Stretchers, Headers & Returns,
8"x8"x2 5/16." & 4"x8"x2 5/16."



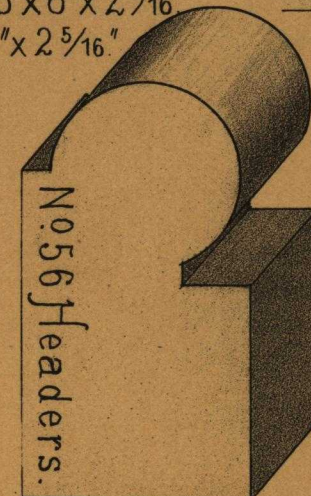
No 167. Stretchers, Headers &
Returns 8"x8"x2 5/16."
& 4"x8"x2 5/16."



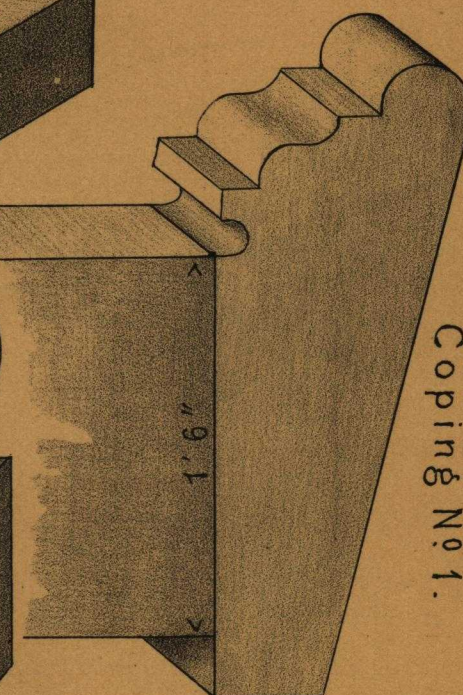
Copping
No 2.



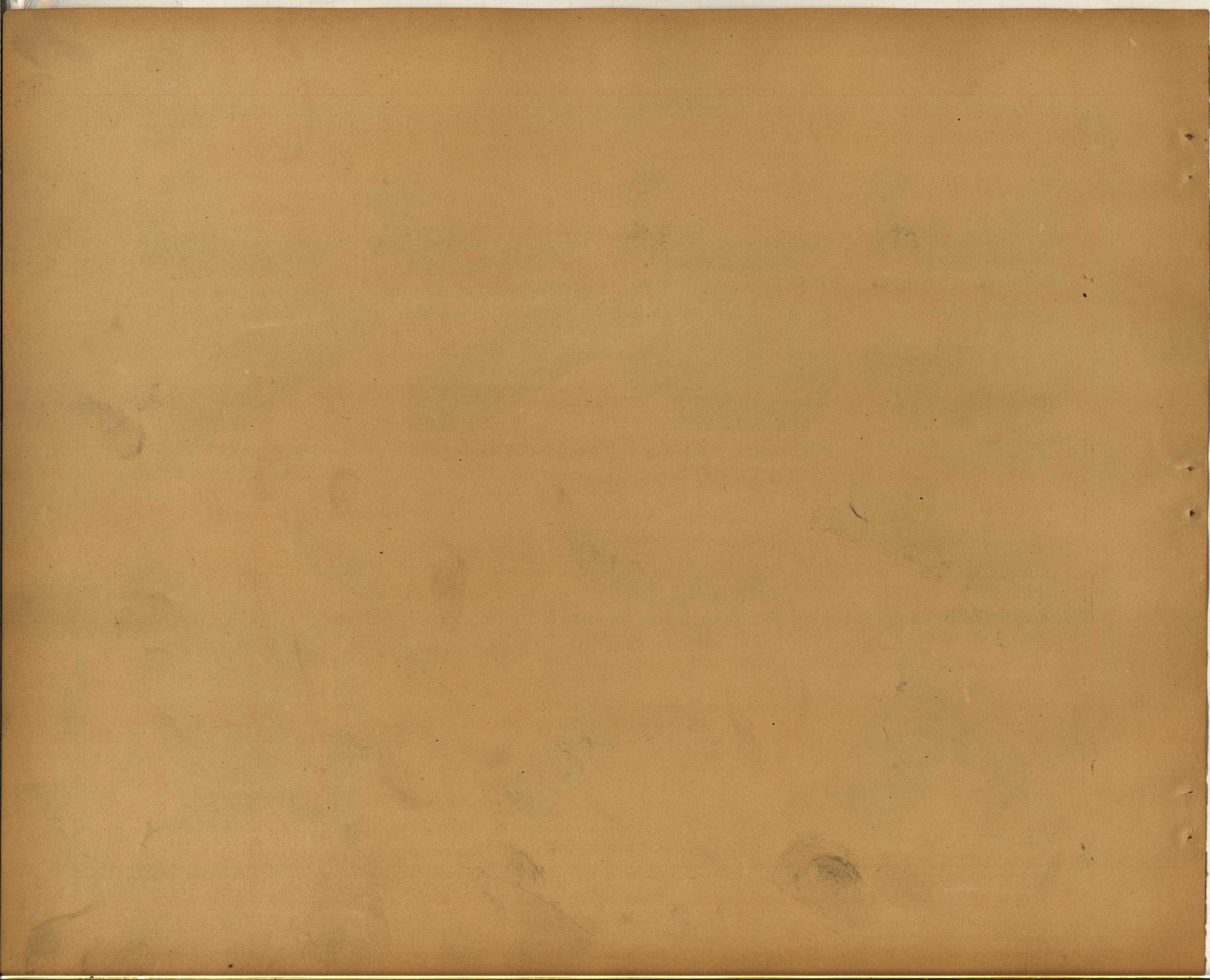
No 168. Headers & Returns, 8"x8"x4 3/8."



No 56 Headers.

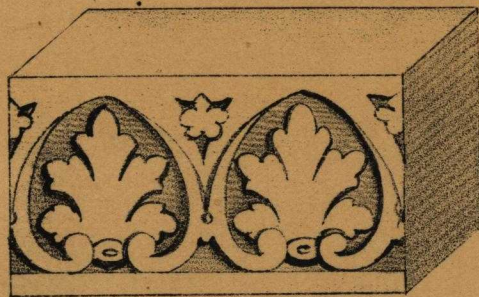


Copping No 1.

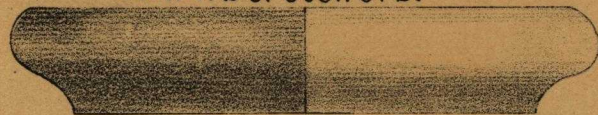


MOULDED BRICK & C.

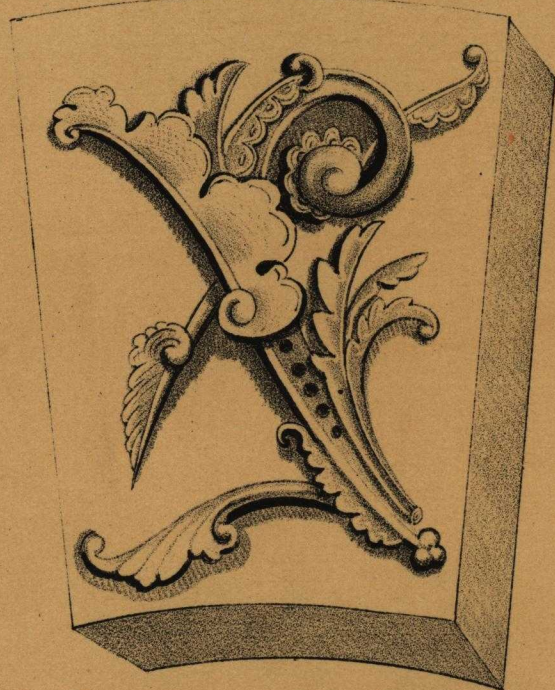
PLATE NO 31.



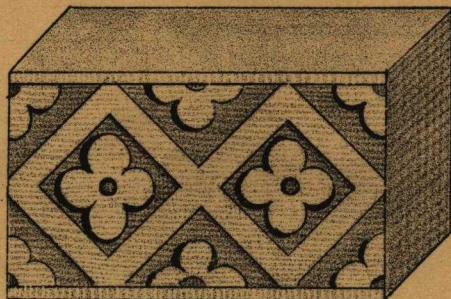
Nº171. Stretchers.



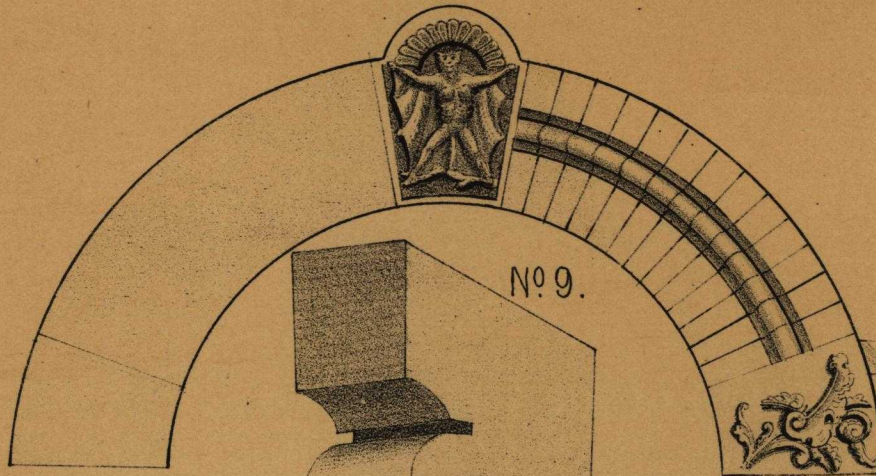
Nº 123 Returns to Nº 6.



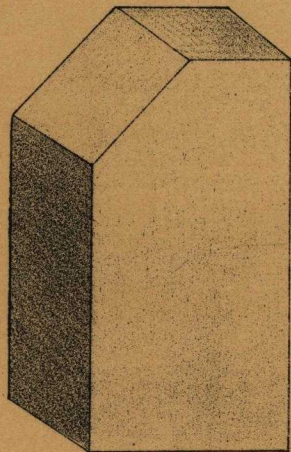
Springer for Nº 9. Arch Brick.



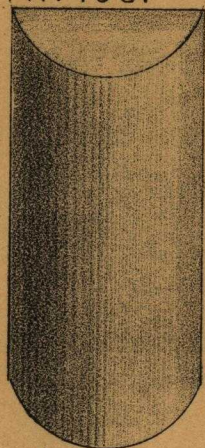
Nº 173. Stretchers.



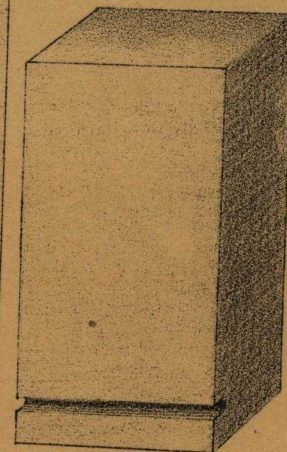
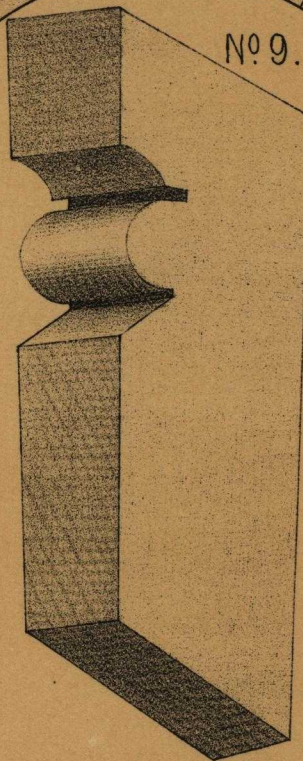
Nº 9.



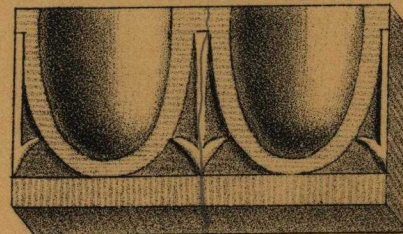
Nº 169.



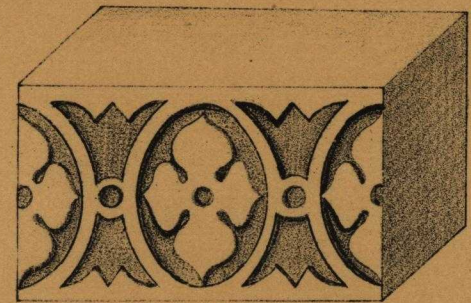
Nº 11.



Nº 170 Drip Brick
Returns 4"x 8".

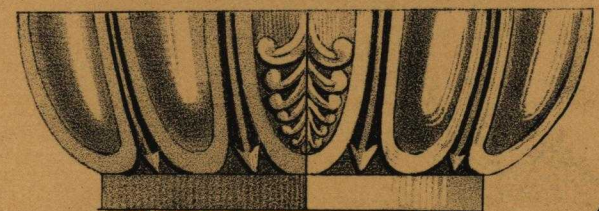
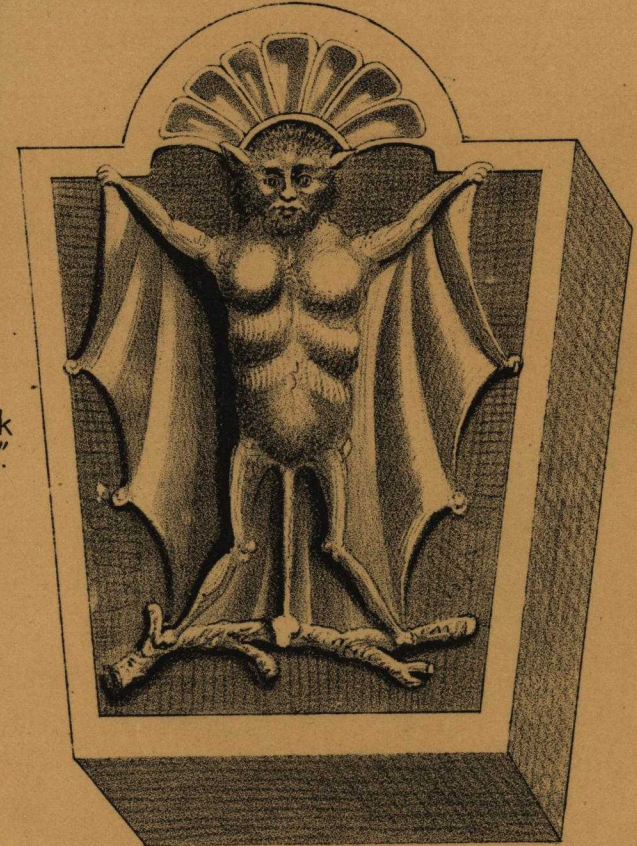


Nº 174.



Nº 172 Stretchers.

Key for Nº 9. Arch Brick.



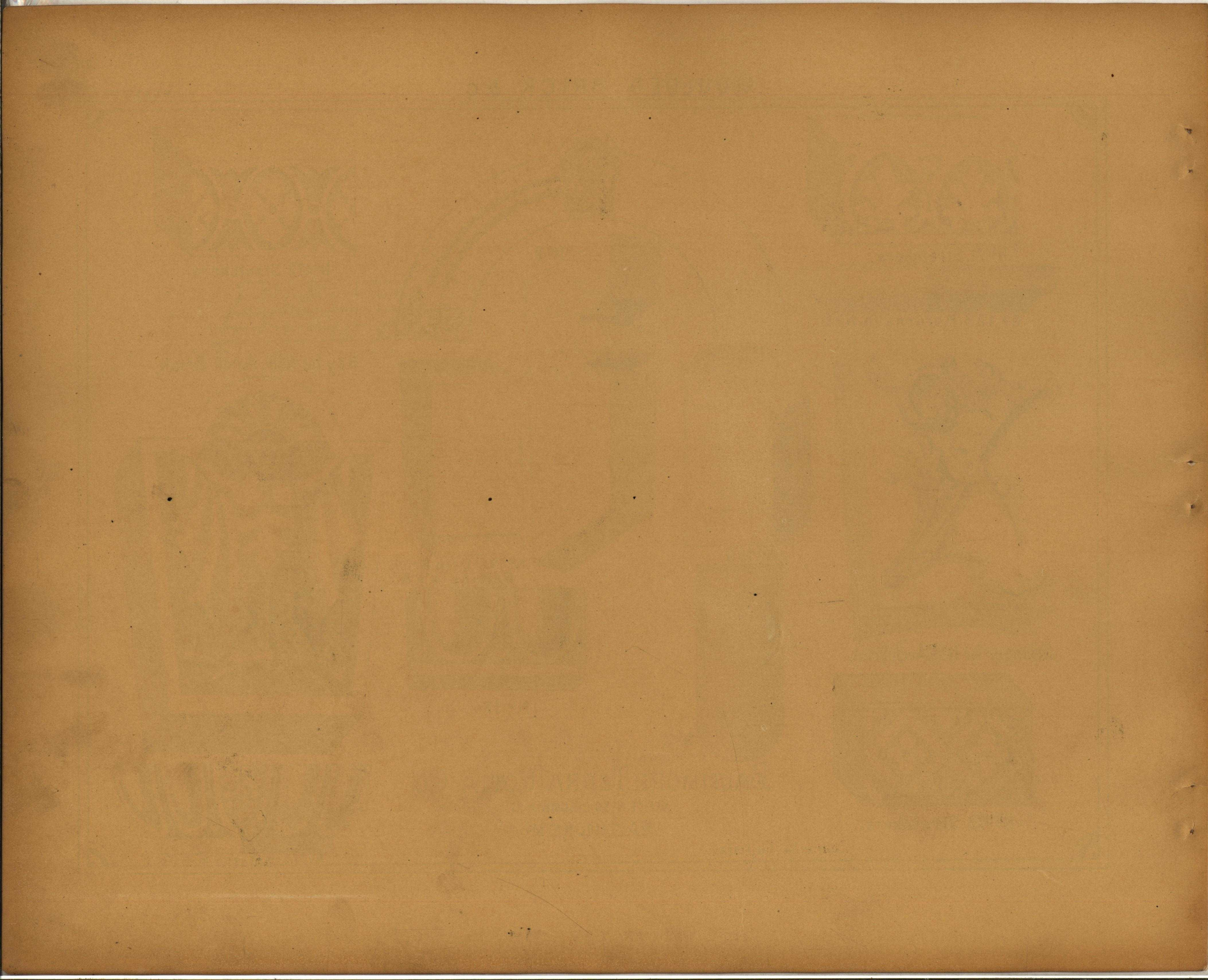
Nº 175 Returns to Nº 174.

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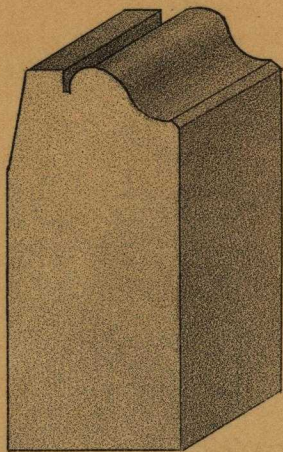
Scale 1/4. Full size.



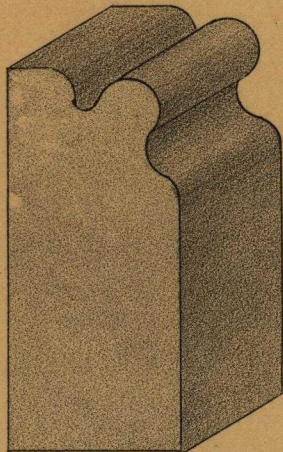
MOULDED BRICK.

PLATE N^o 32.

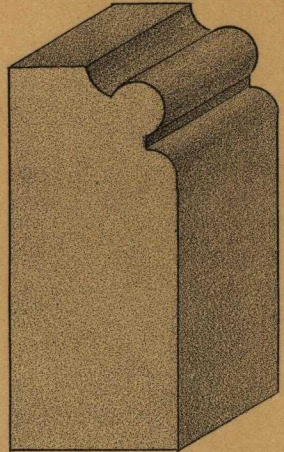
BALTIMORE TERRA COTTA CO.
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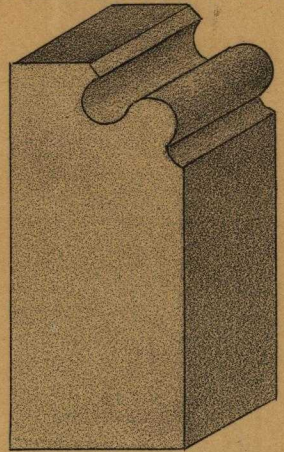
N^o 176 8"x8" by
4 1/4" Returns.



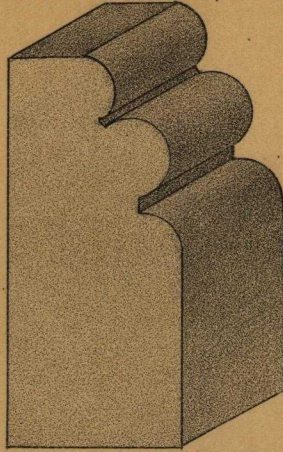
N^o 177 8"x8" by
4 1/4" Returns.



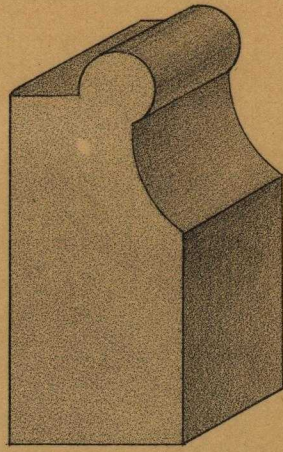
N^o 178 8"x8" by
4 1/4" Returns.



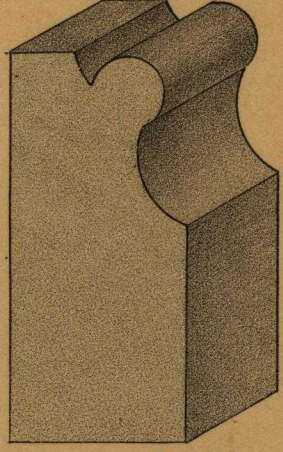
N^o 179 8"x8" by
4 1/4" Returns.



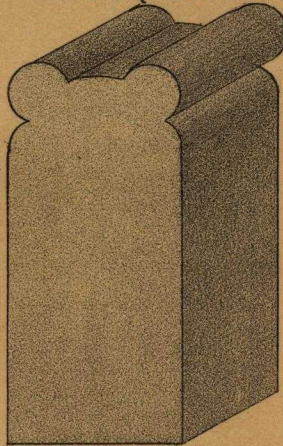
N^o 180 8"x8" by
4 1/4" Returns.



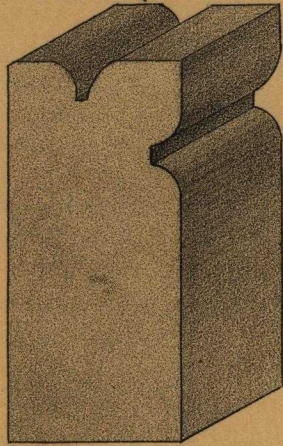
N^o 181 8"x8" by
4 1/4" Returns.



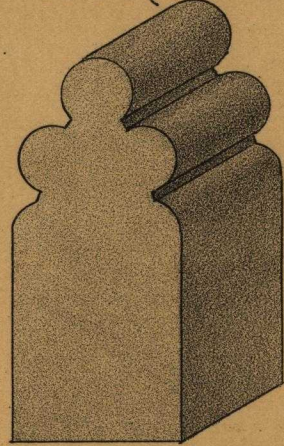
N^o 182 8"x8" by
4 1/4" Returns.



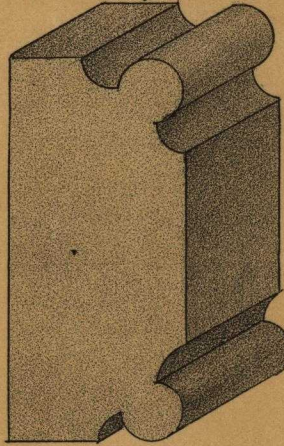
N^o 183 8"x8" by
4 1/4" Returns.



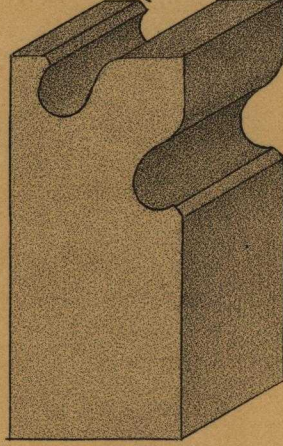
N^o 184 8"x8" by
4 1/4" Returns.



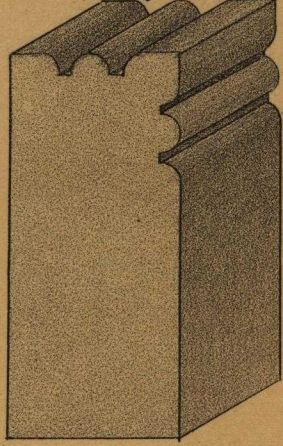
N^o 185 8"x8" by
4 1/4" Returns.



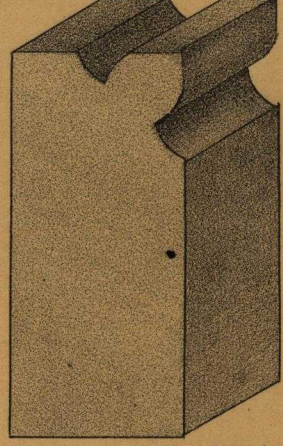
N^o 186 8"x8" by
4 1/4" Returns.



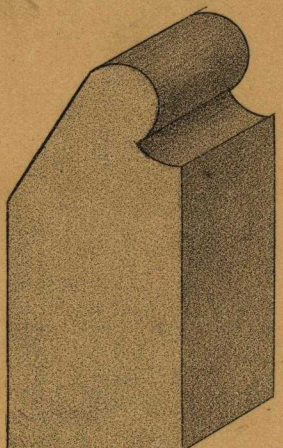
N^o 187 8"x8" by
4 1/4" Returns.



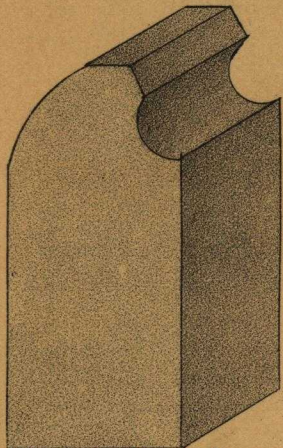
N^o 188 8"x8" by
4 1/4" Returns.



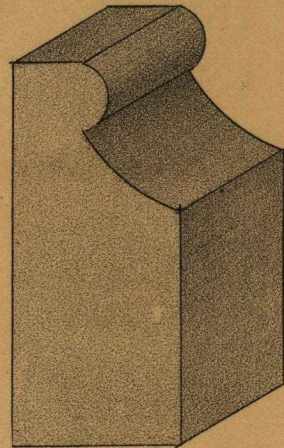
N^o 189 8"x8" by
4 1/4" Returns.



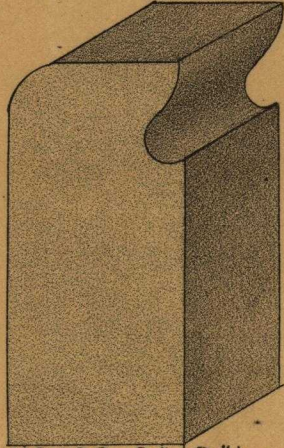
N^o 190 8"x8" by
4 1/4" Returns.



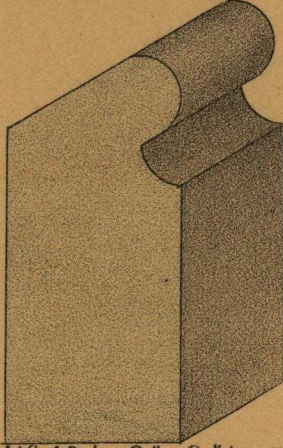
N^o 191 8"x8" by
4 1/4" Returns.



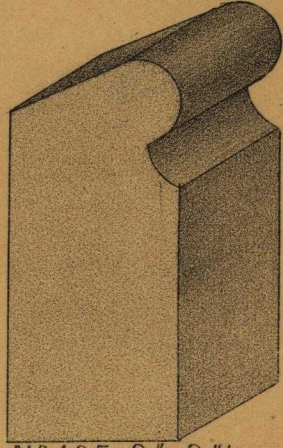
N^o 192 8"x8" by
4 1/4" Returns.



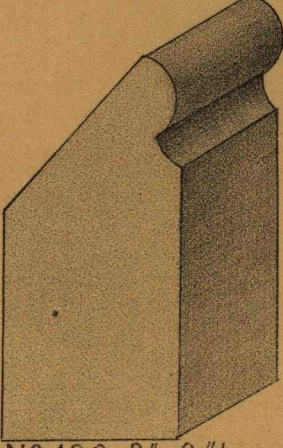
N^o 193 8"x8" by
4 1/4" Returns.



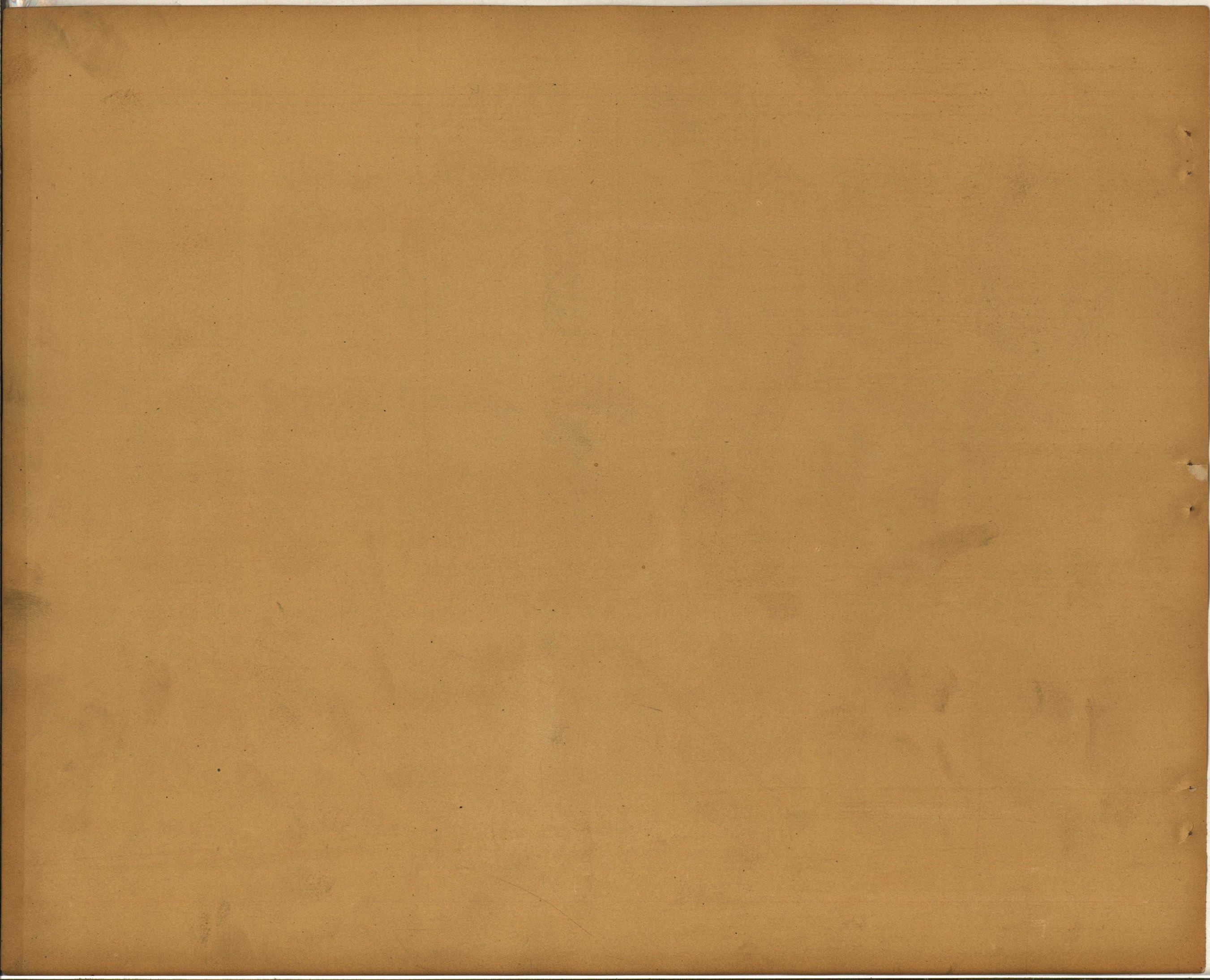
N^o 194 8"x8" by
4 1/4" Returns.



N^o 195 8"x8" by
4 1/4" Returns.

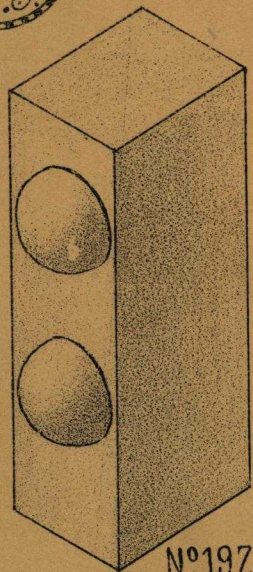


N^o 196 8"x8" by
4 1/4" Returns.

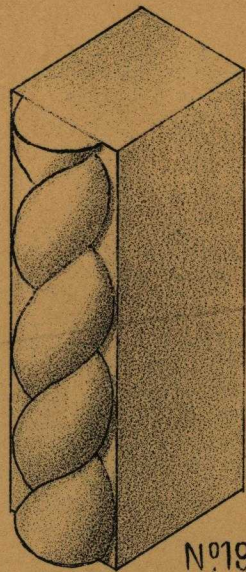


MOULDED BRICK.

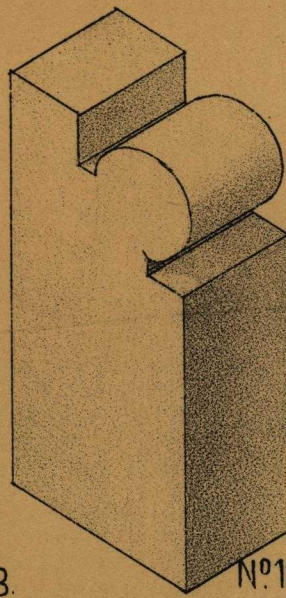
PLATE N°33.



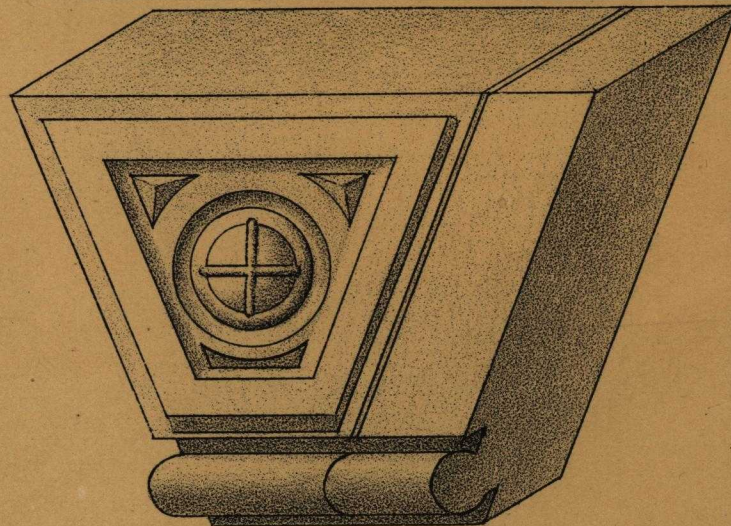
N°197.
Stretchers.



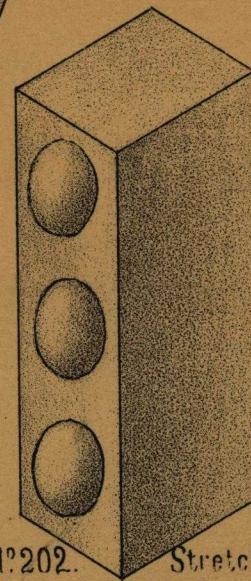
N°198.
Stretchers & Returns.



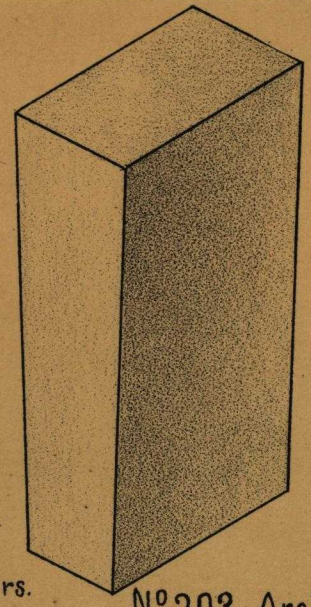
N°199. Headers for Jambs.
Rets. 8" x 8".



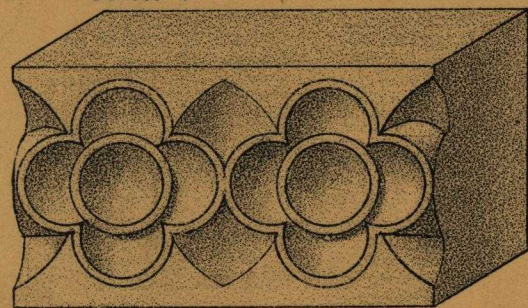
N°200. N°201
Key for 201.



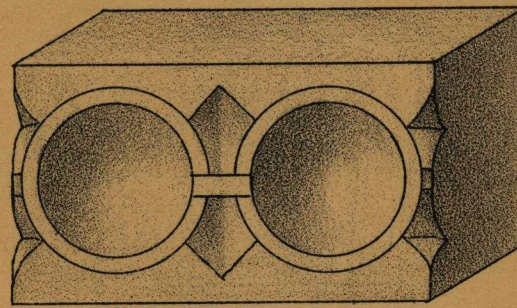
N°202. Stretchers.
Rets. 8" x 8" x 2 1/16".



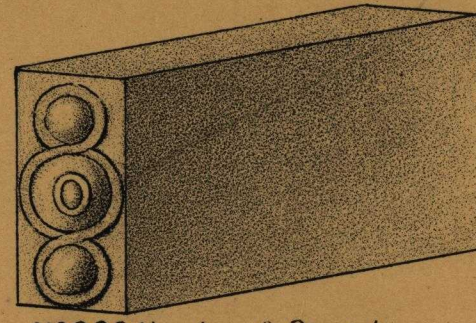
N°203. Arch.



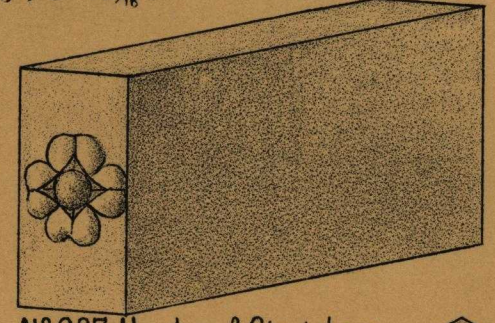
N°204. Stretchers.
Rets. 8" x 8" x 4 1/4".



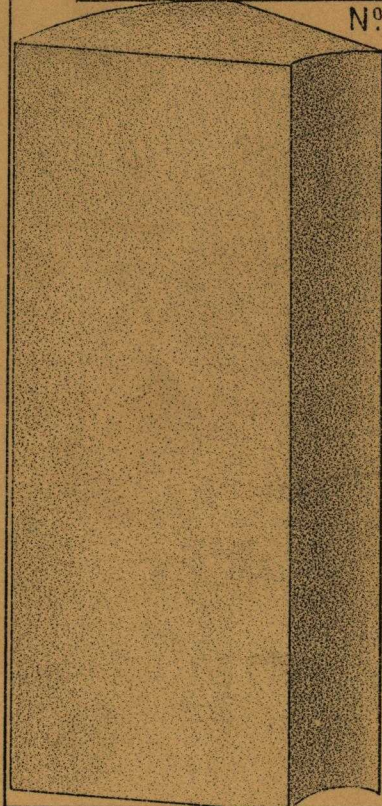
N°205. Stretchers.
Rets. 8" x 8" x 4 1/4".



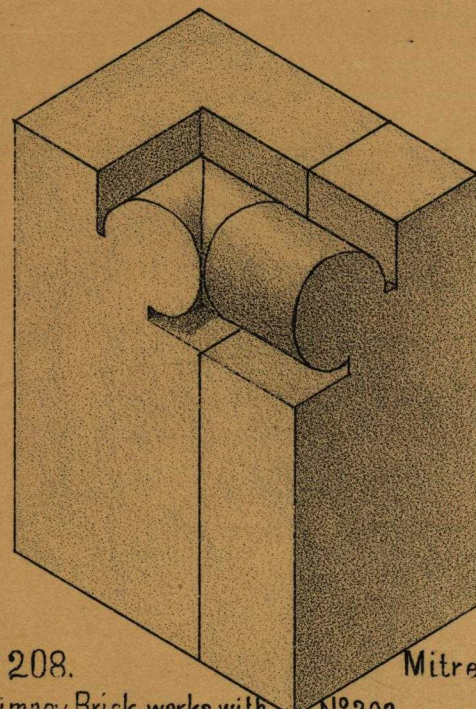
N°206. Headers & Stretchers.
Rets. 4" x 8".



N°207. Headers & Stretchers.
Rets. 4" x 8".

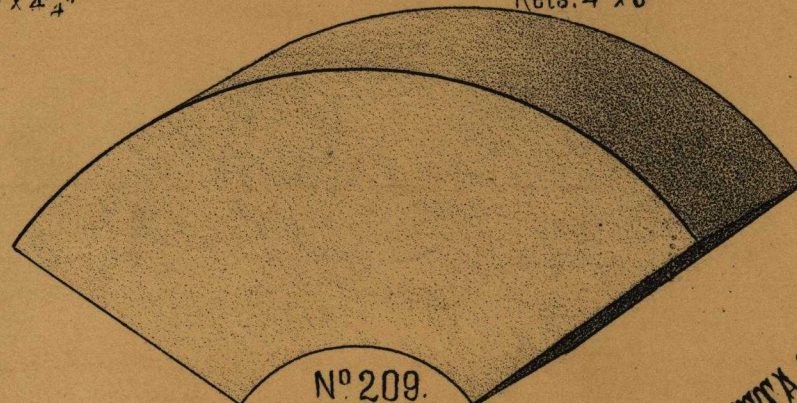


N°208.
Chimney Brick. works with

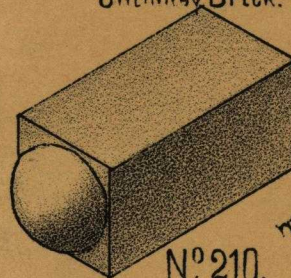


Mitre for N°199.

N°209.

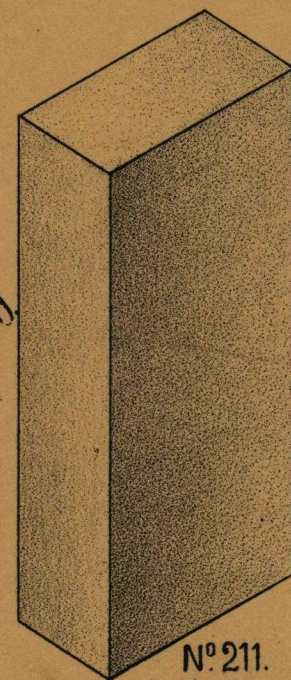


N°209.
Chimney Brick. works with N°208.

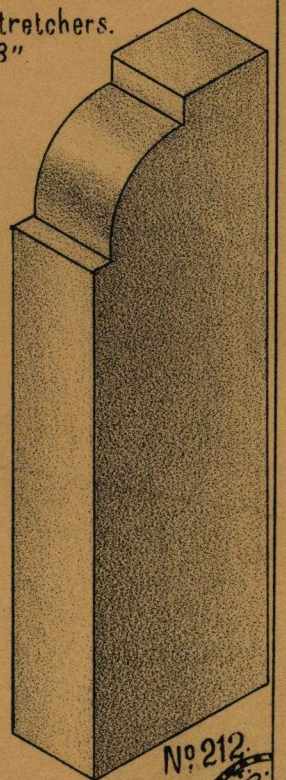


N°210.

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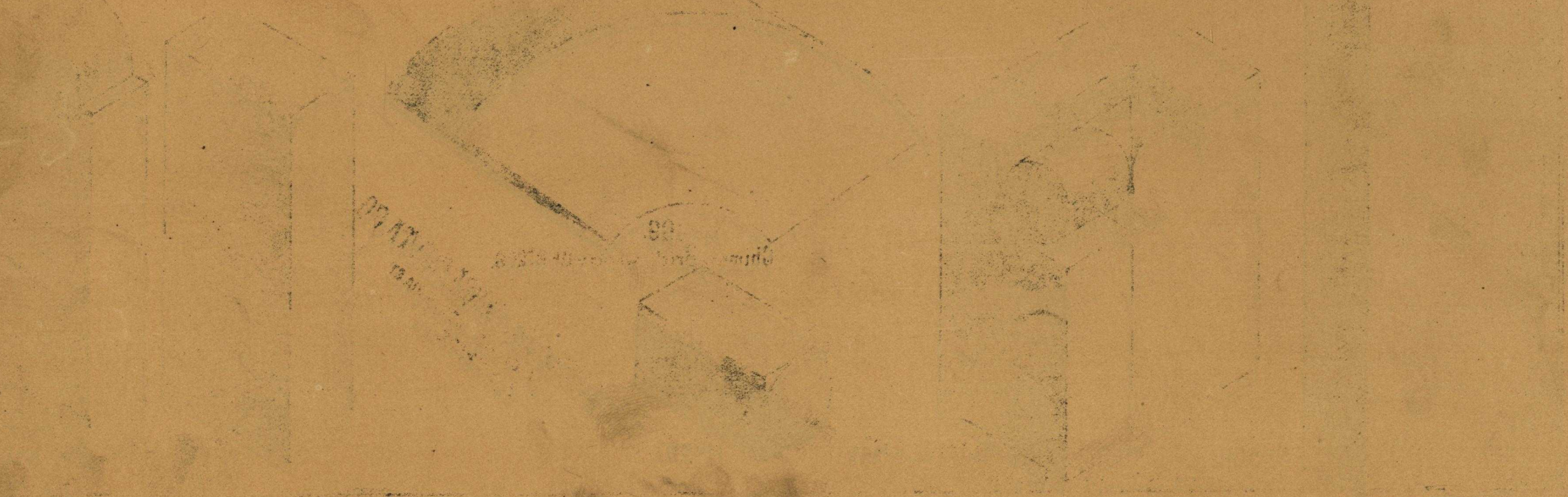
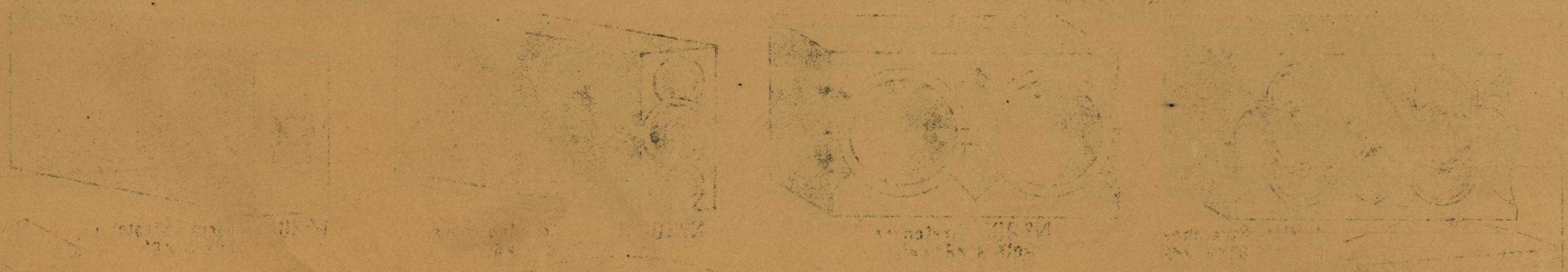
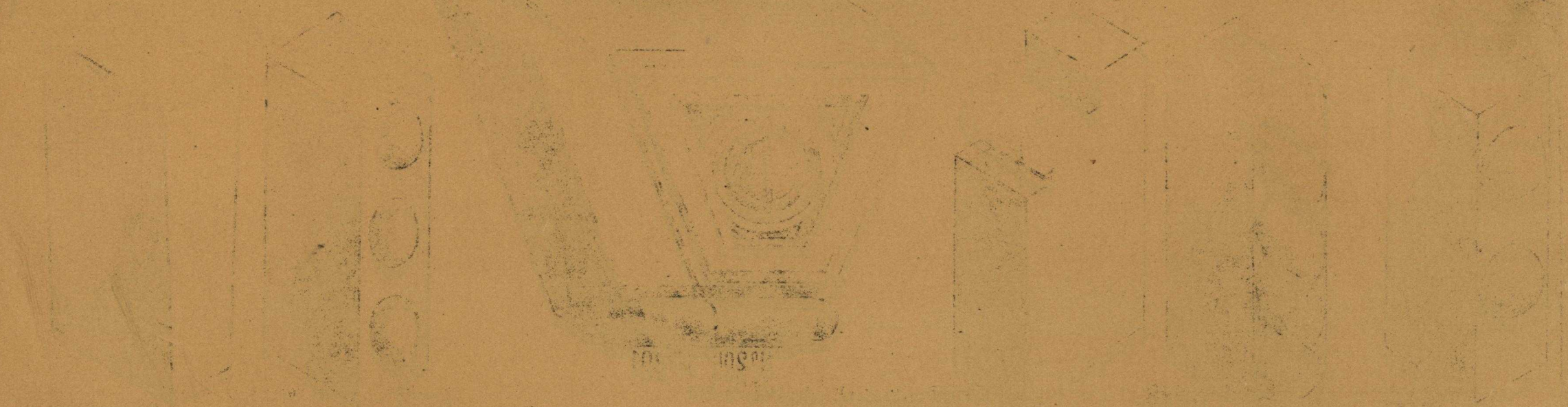


N°211.
Arch.



N°212.
Arch.

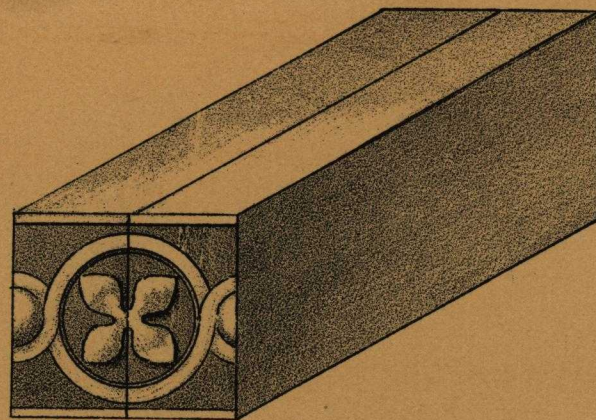
MAIN GED BLOCK



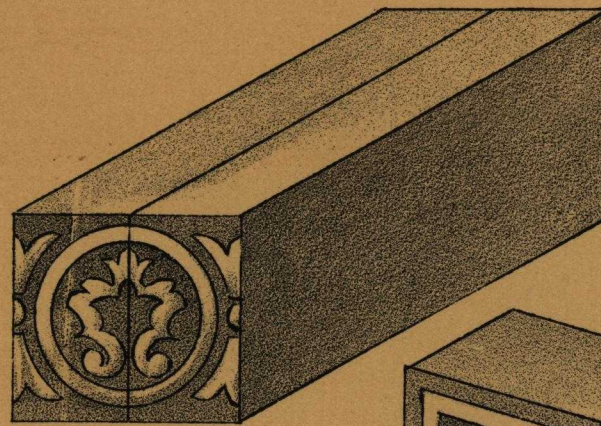
MOULDED BRICK.

PLATE N° 34.

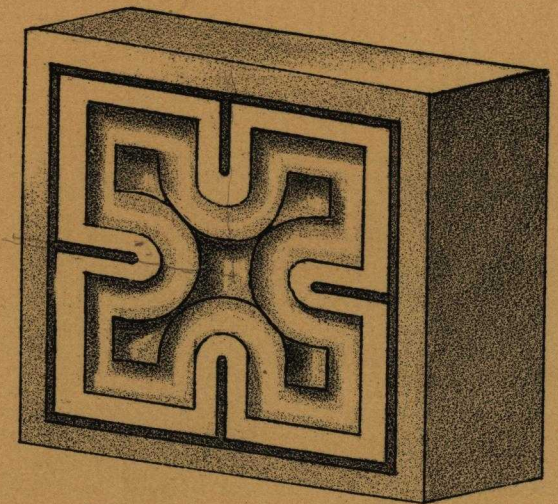
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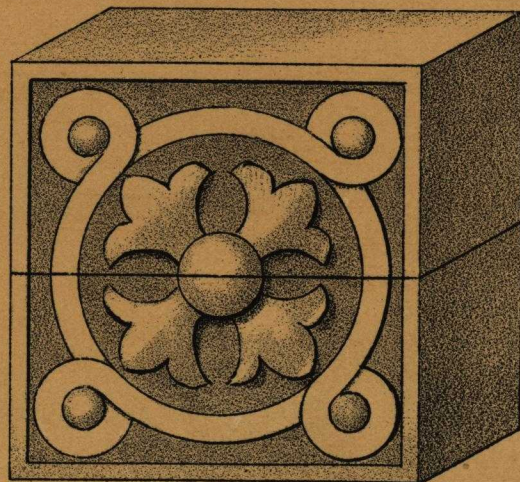
N° 213. Headers.



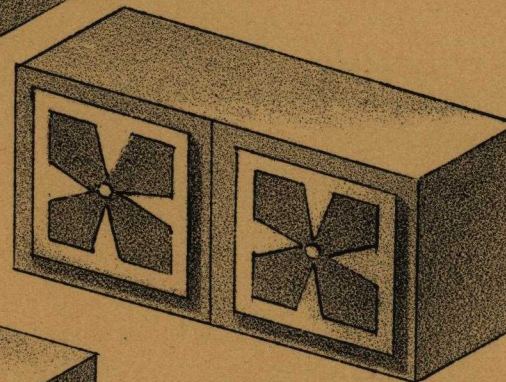
N° 214. Headers.



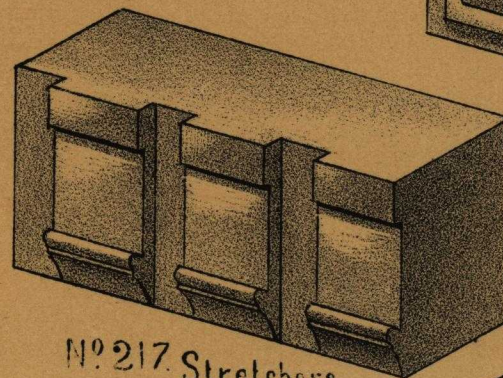
N° 215. Equal to 2 Bricks in width.



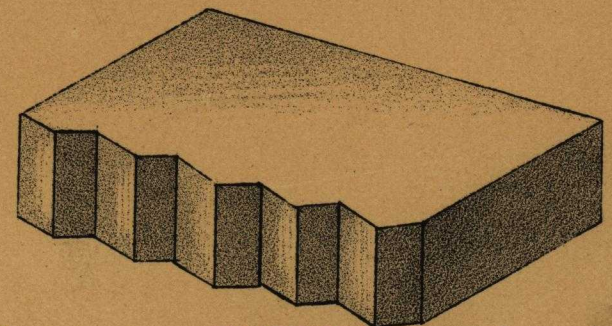
N° 216. Equal to 2 Bricks in width.



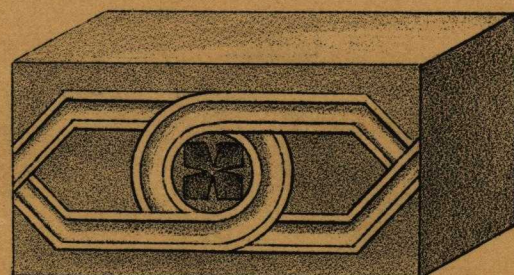
N° 218. Stretchers.



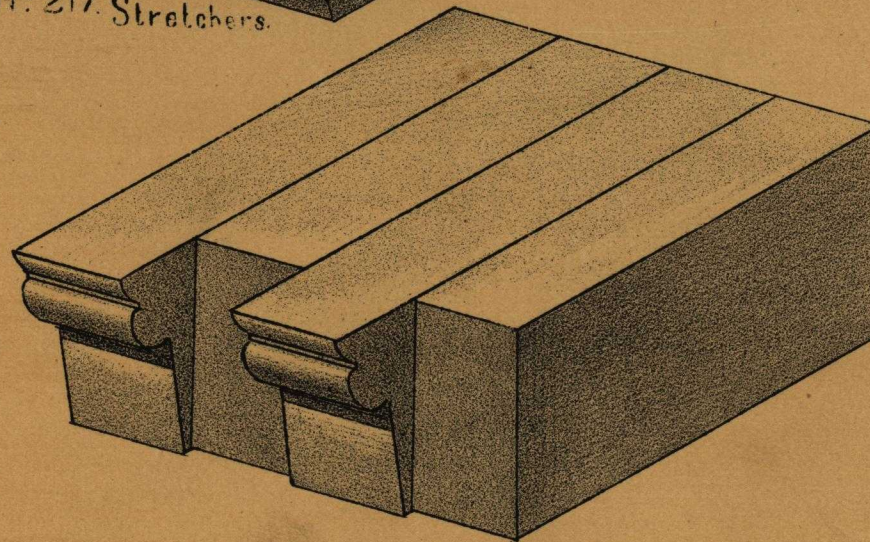
N° 217. Stretchers.



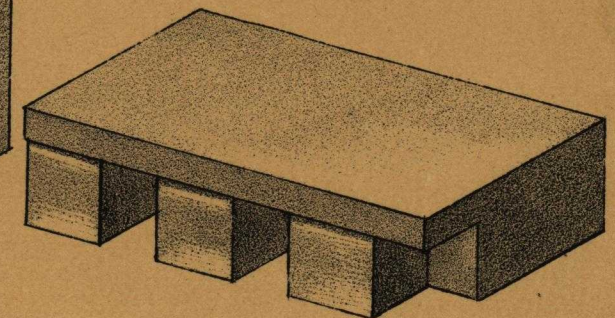
N° 219. Stretchers.



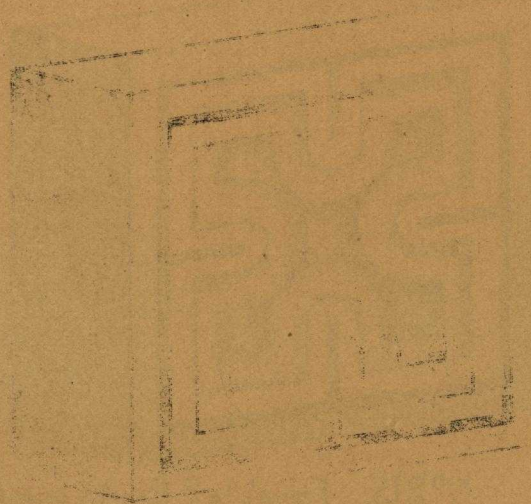
N° 220. Stretchers.



N° 221. Headers.

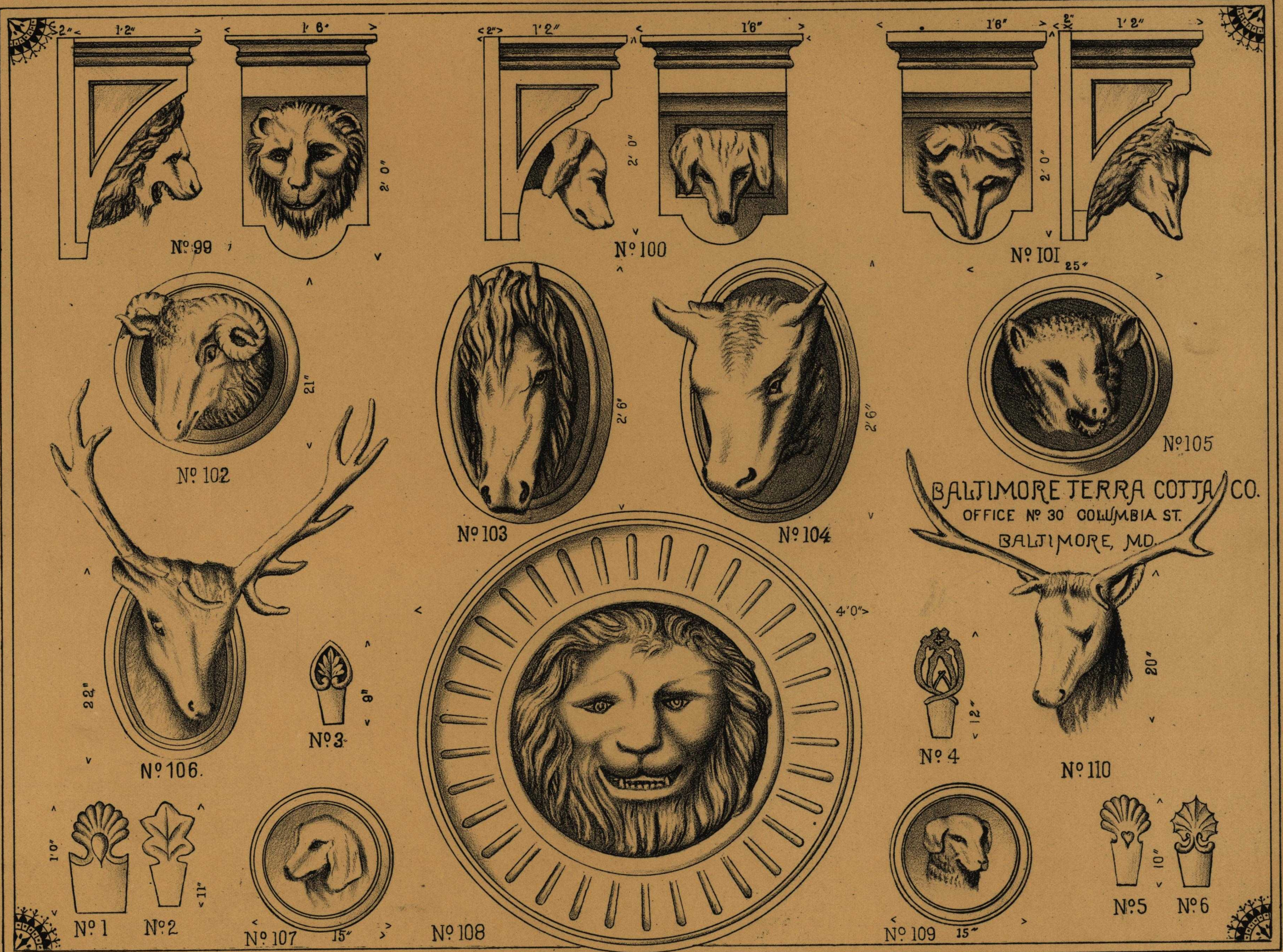


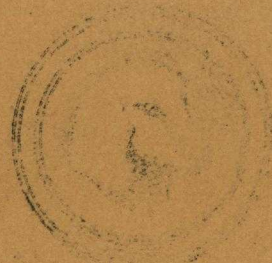
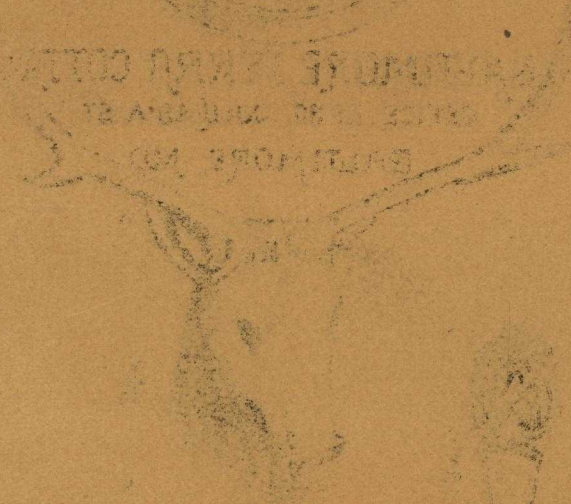
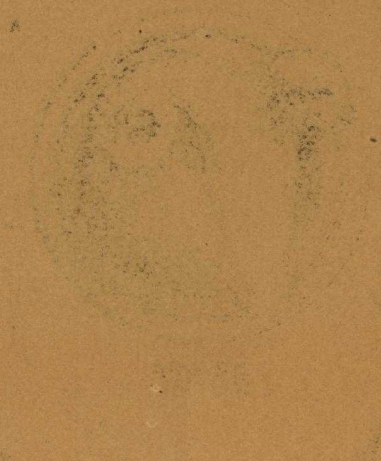
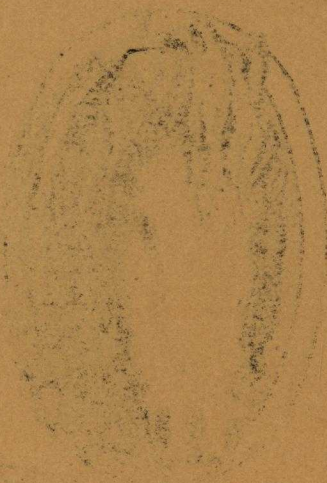
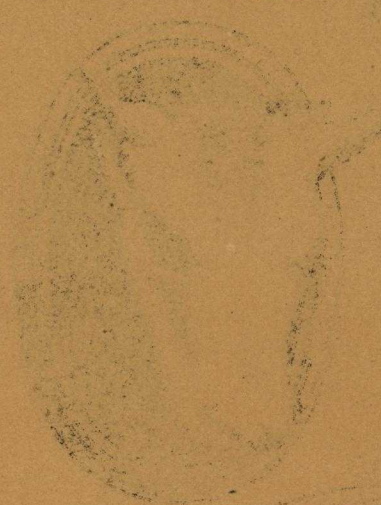
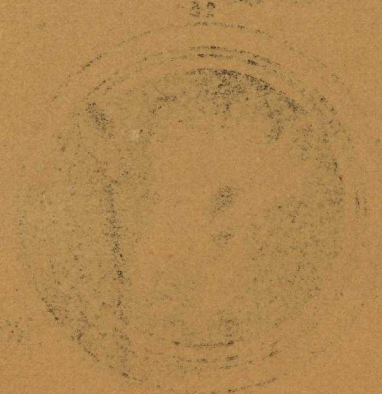
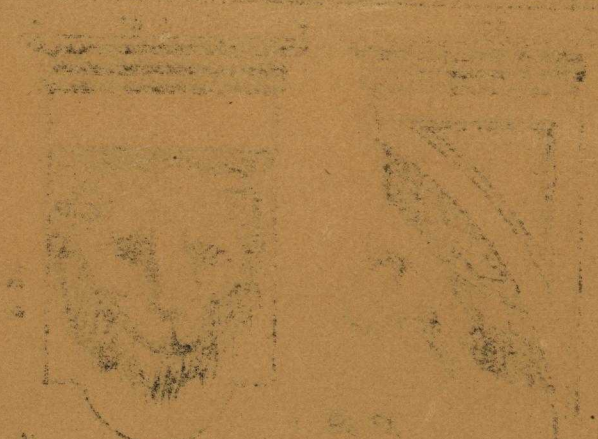
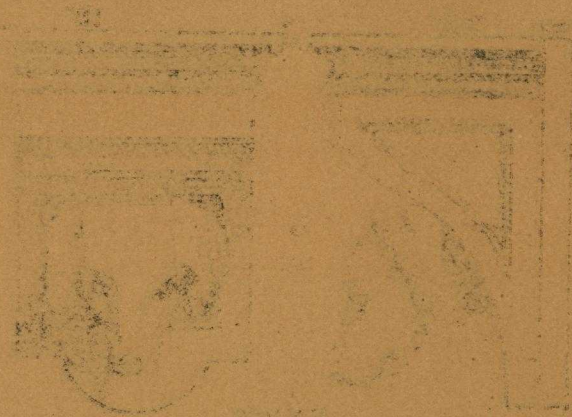
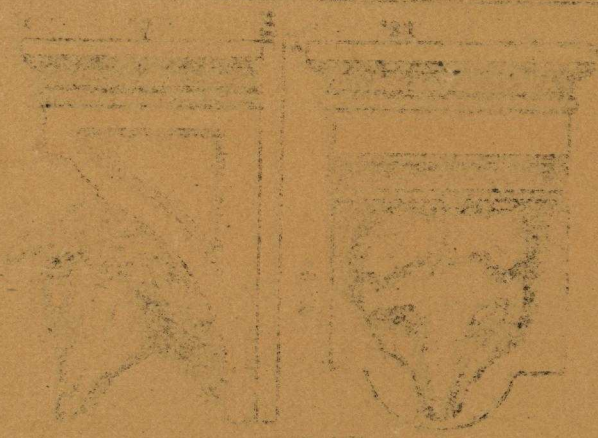
N° 222. Stretchers.



HEADS &c.

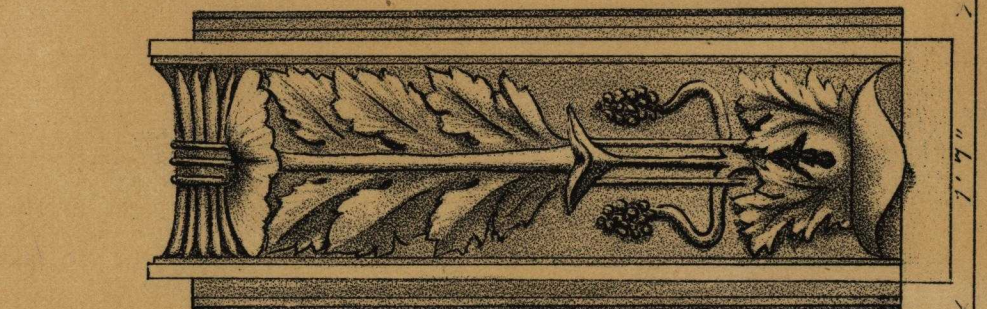
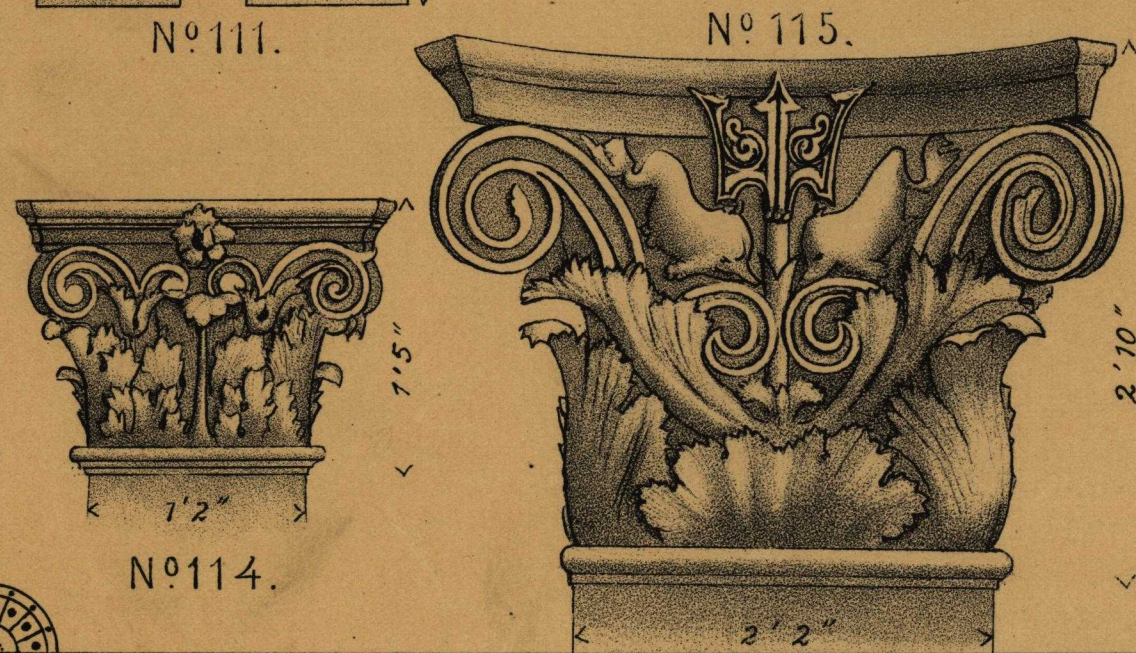
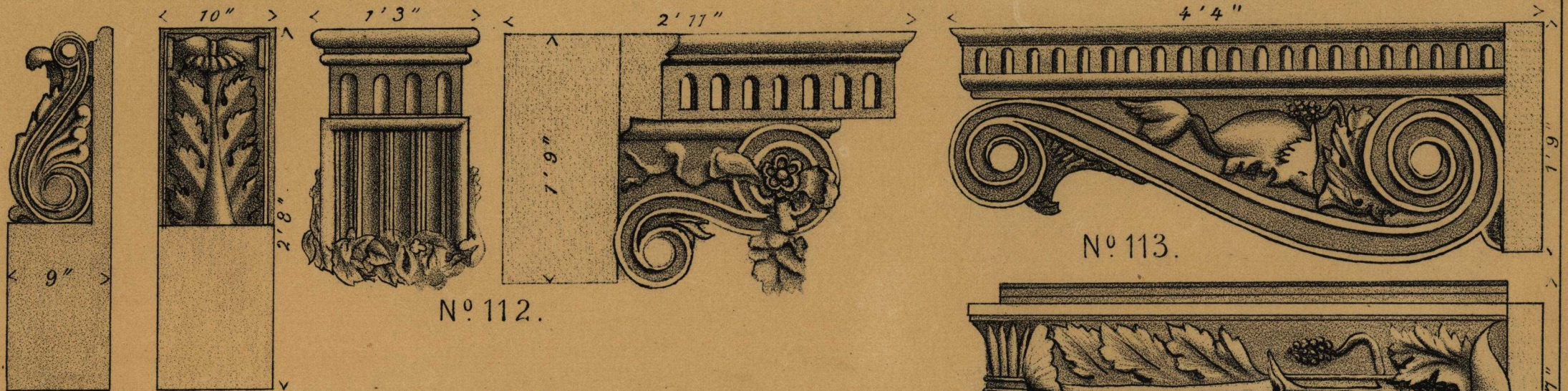
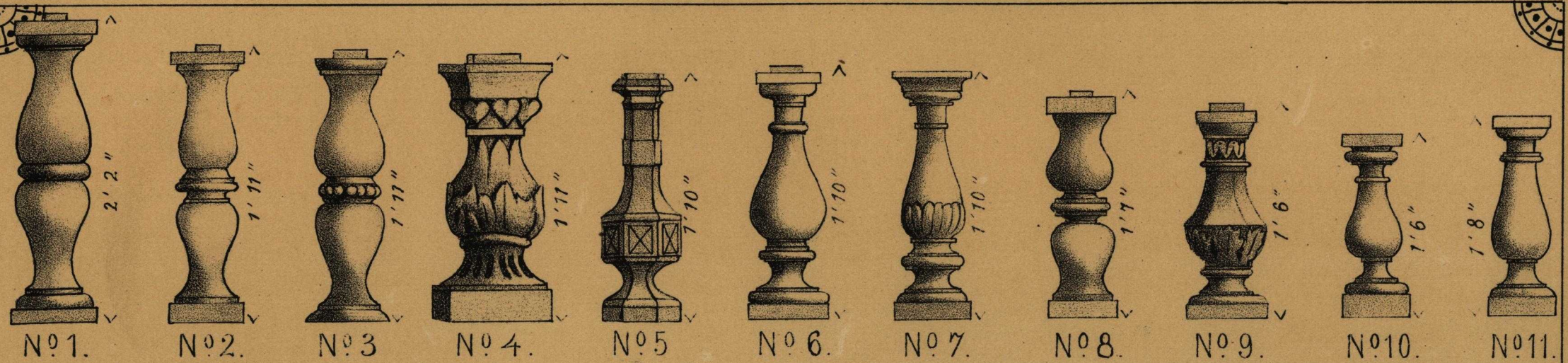
PLATE N°35



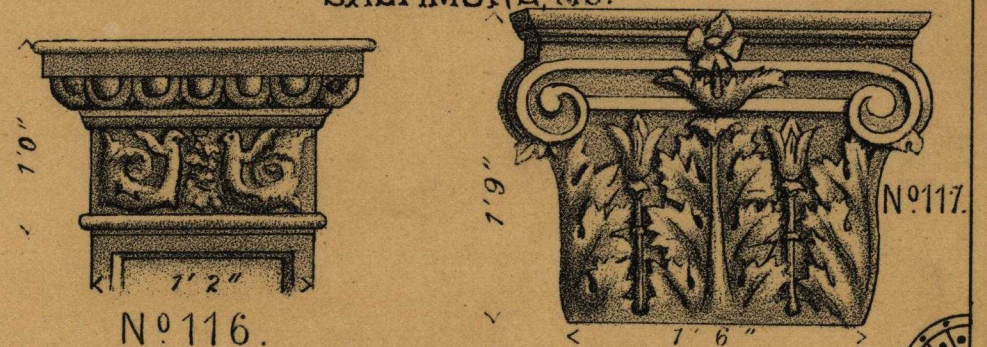


BALUSTERS, CAPS &c.

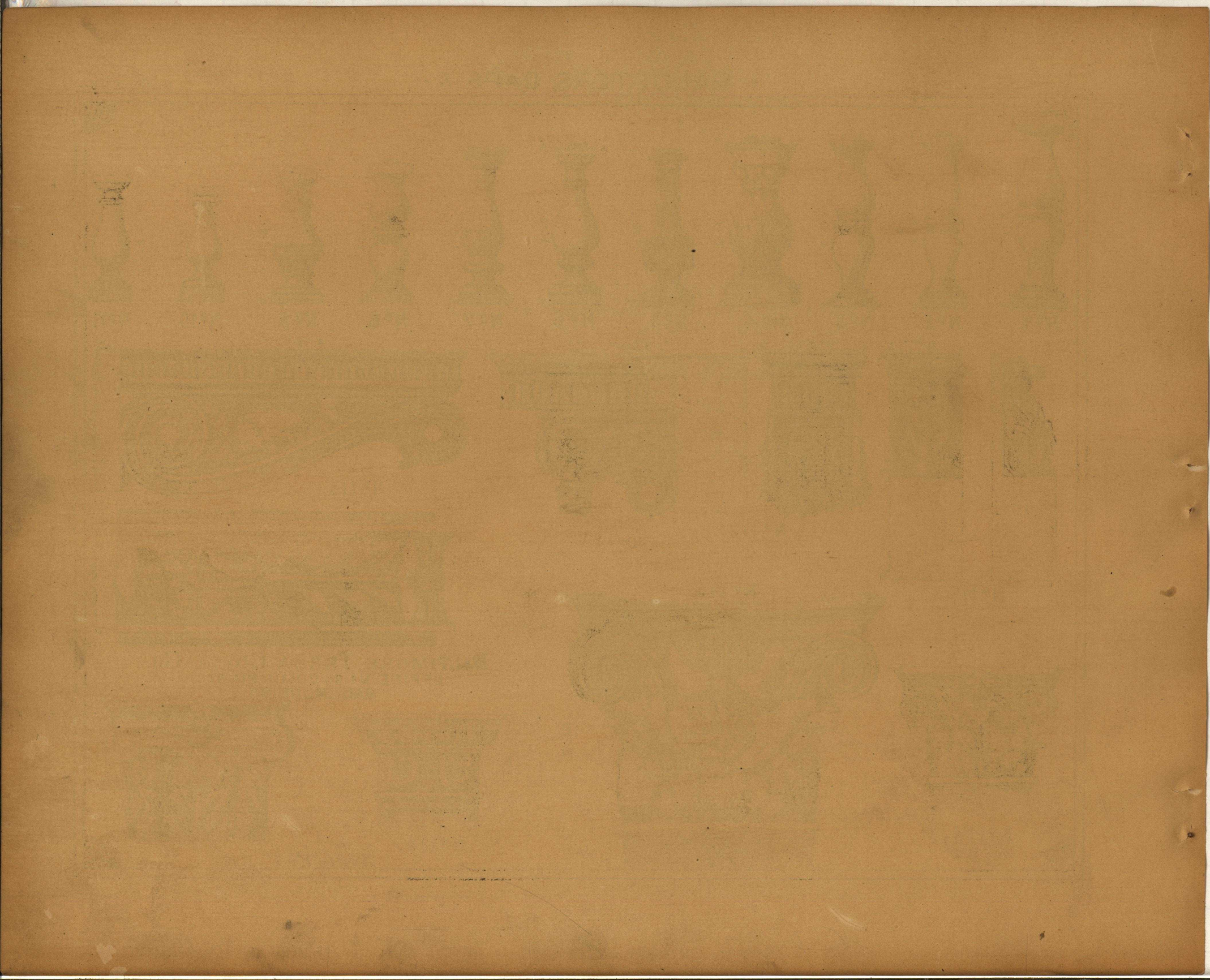
PLATE N^o 36.



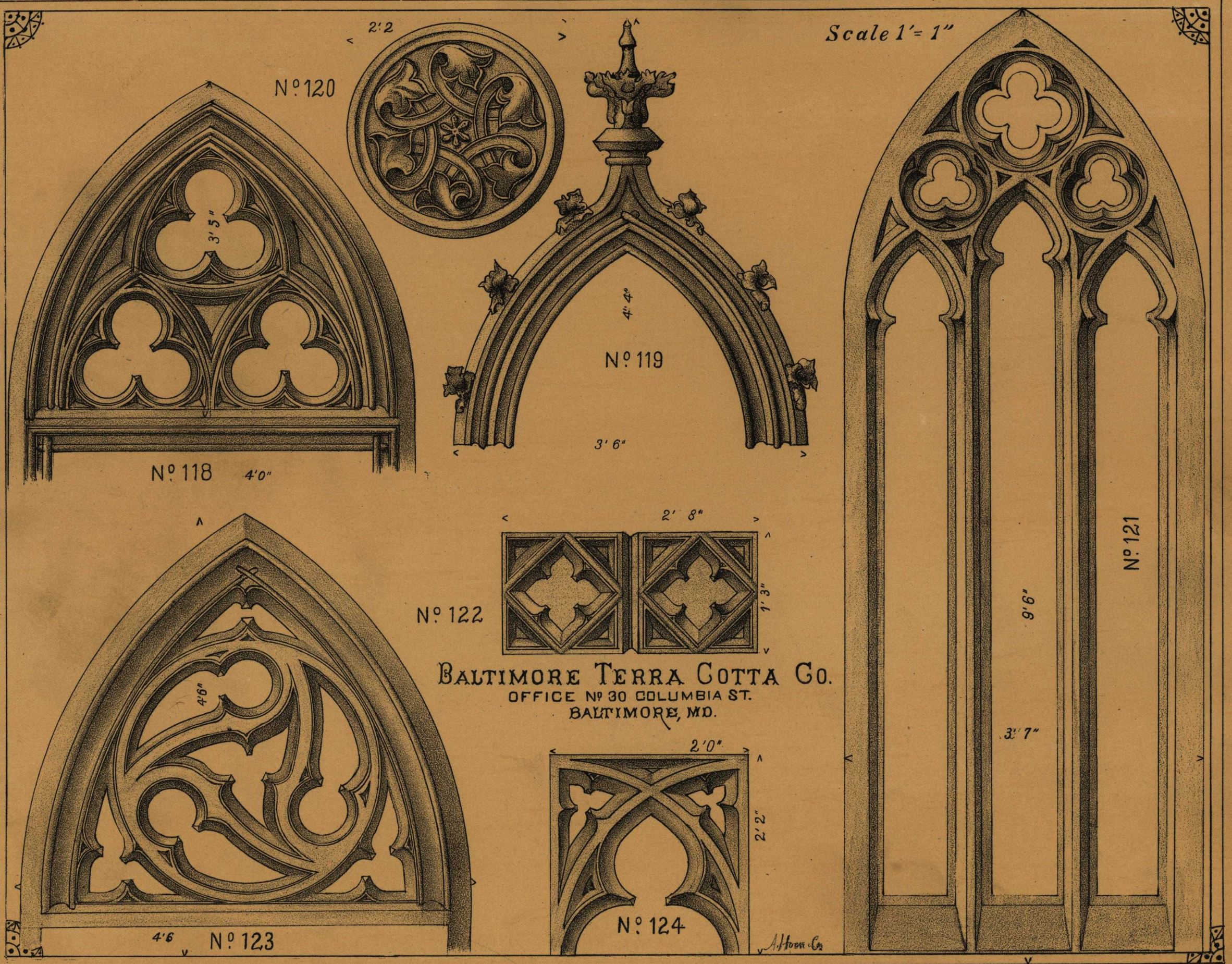
BALTIMORE, TERRA COTTA CO.
OFFICE, N^o 30 COLUMBIA ST.
BALTIMORE, MD.



Scale 1' = 1"

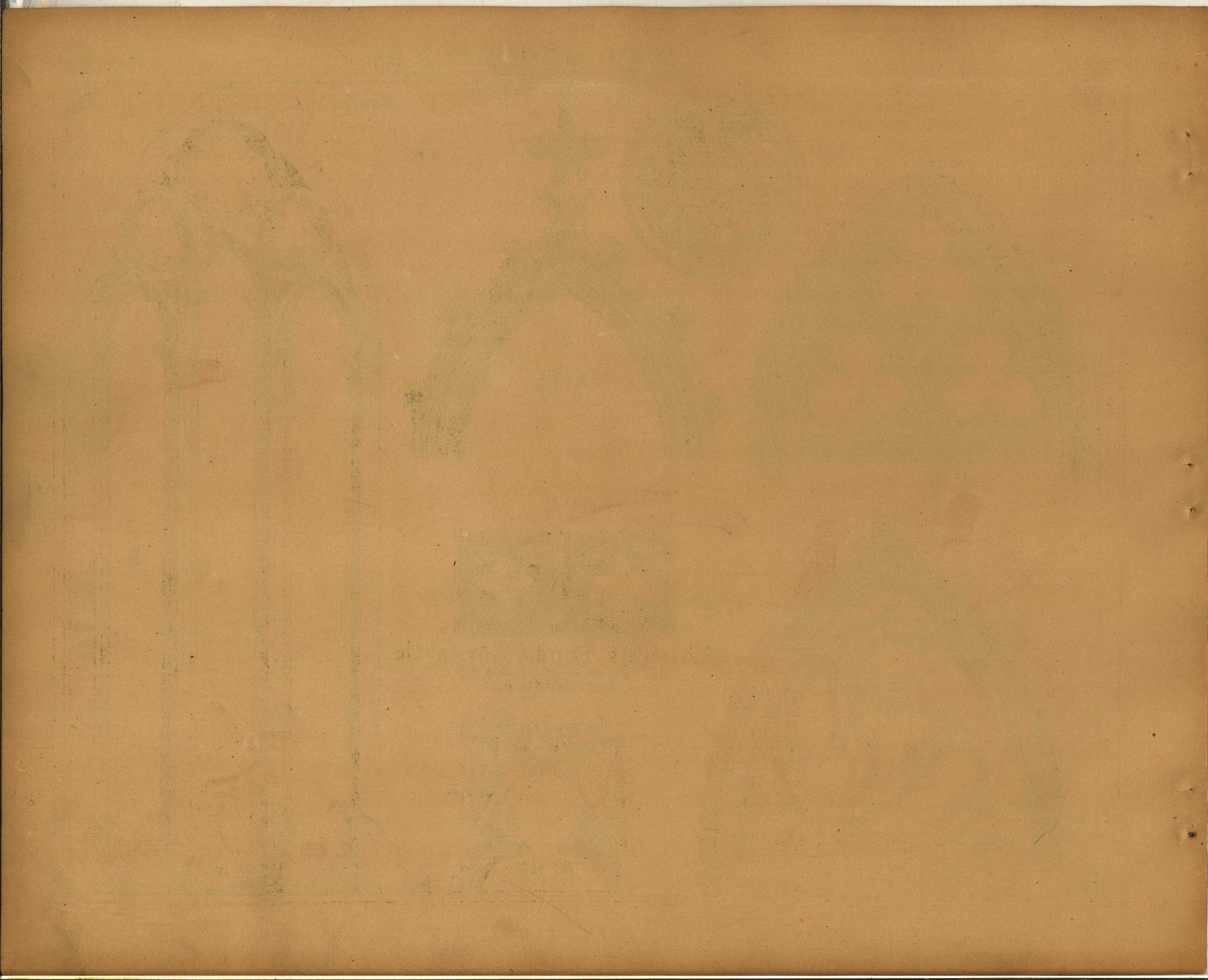


Scale 1' = 1"



BALTIMORE TERRA COTTA CO.
OFFICE Nº 30 COLUMBIA ST.
BALTIMORE, MD.

Alford & Co.

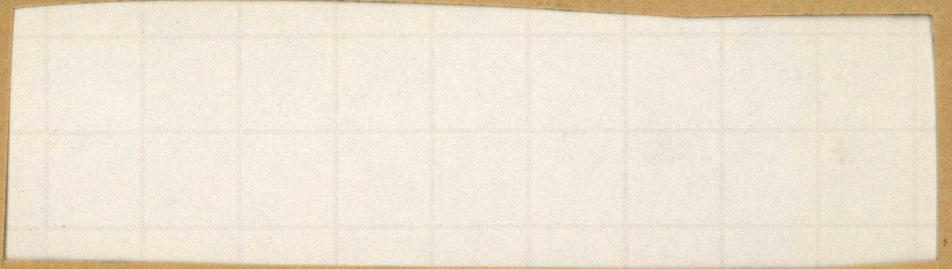


BALTIMORE TERRA COTTA CO.

OFFICE NO 30 COLUMBIA ST. BALTIMORE, MD.

PLATE NO 38.

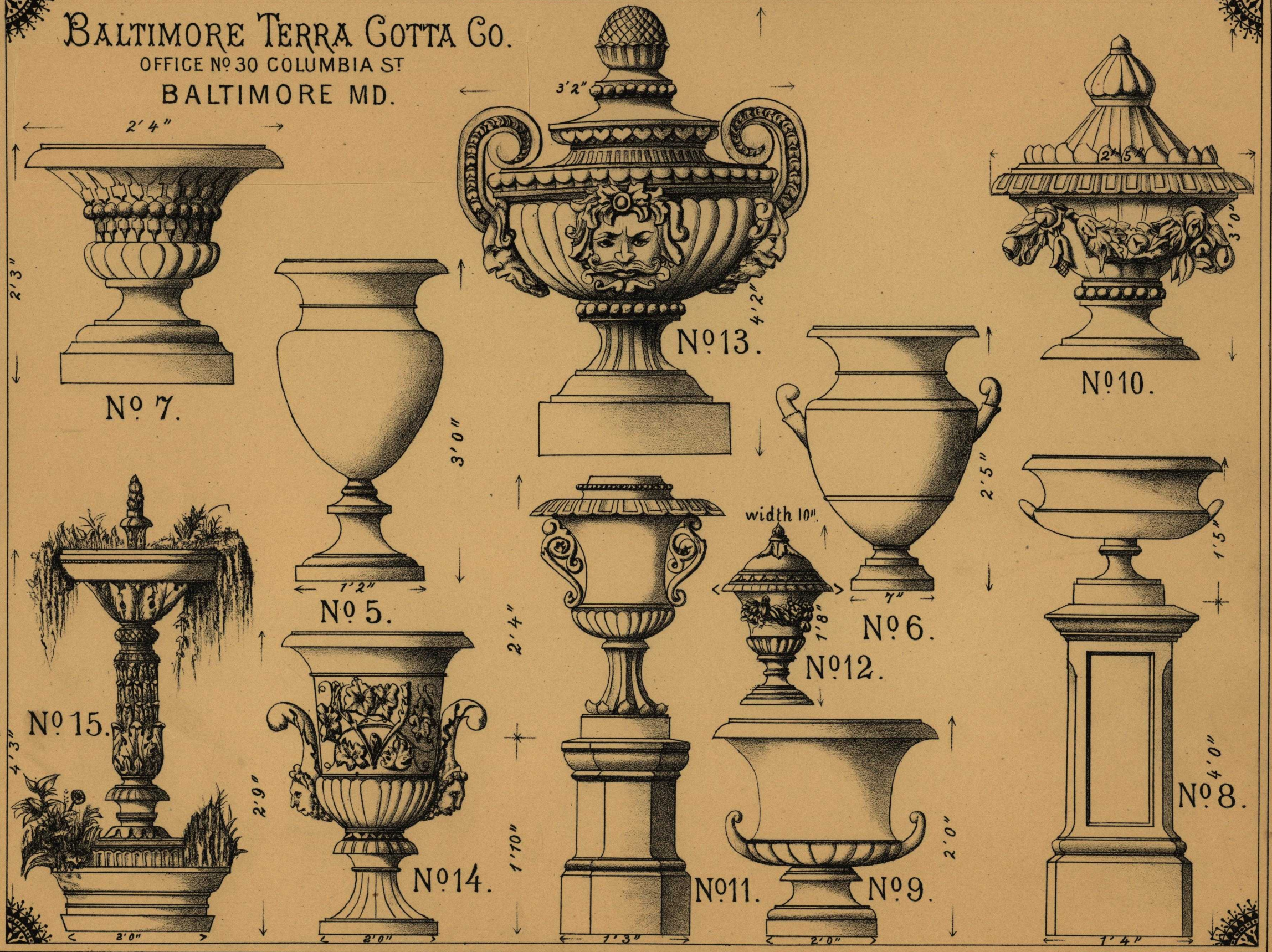


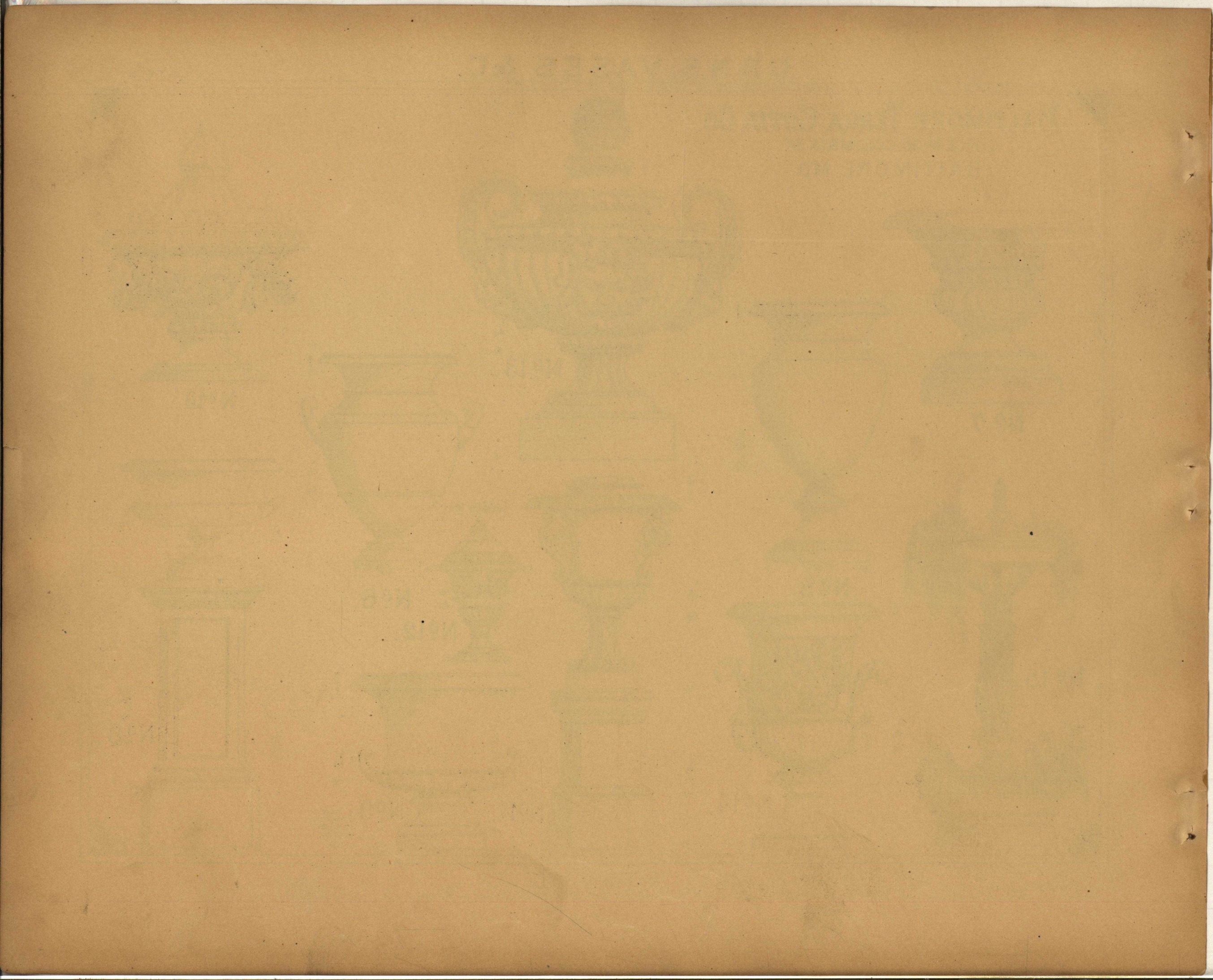


URNS, VASES & C.

PLATE N^o 39.

BALTIMORE TERRA COTTA CO.
OFFICE N^o 30 COLUMBIA ST
BALTIMORE MD.

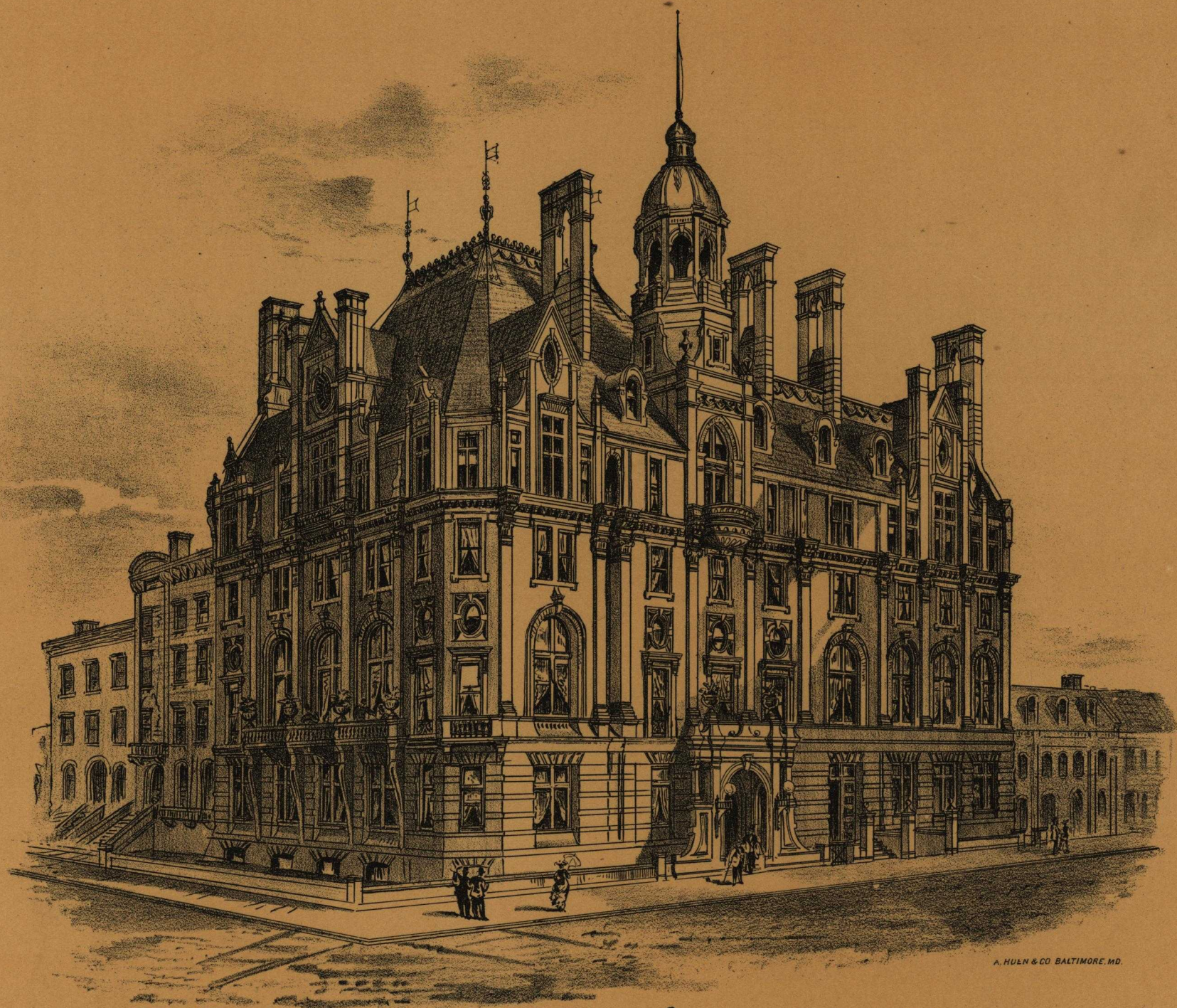




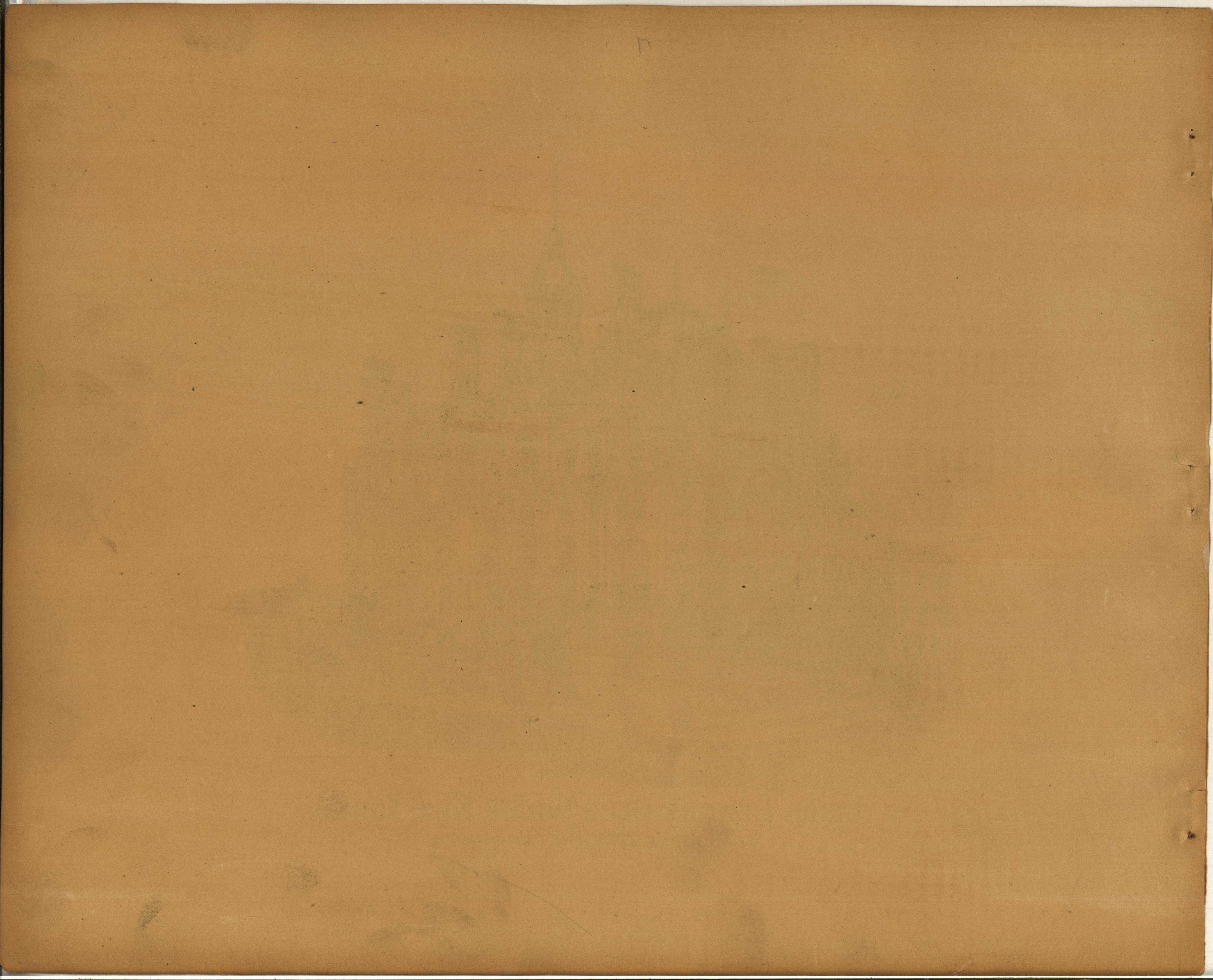


A. HOEN & CO. BALTIMORE, MD.

WESTERN UNION TELEGRAPH BUILDING, NEW-YORK.
GEO. B. POST Architect.



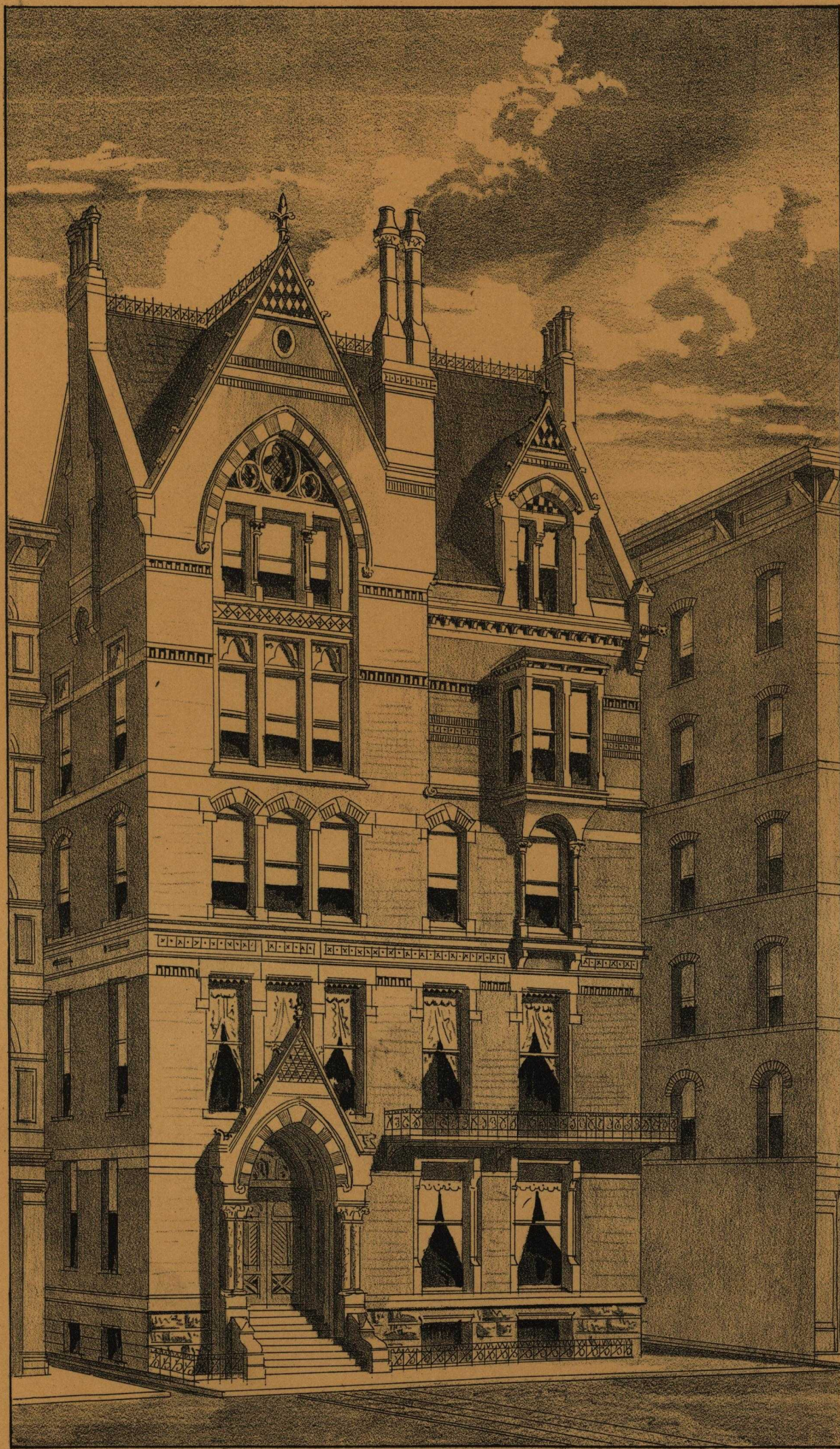
UNION LEAGUE CLUB HOUSE NEW YORK.
PEABODY & STEARNS, Architects.



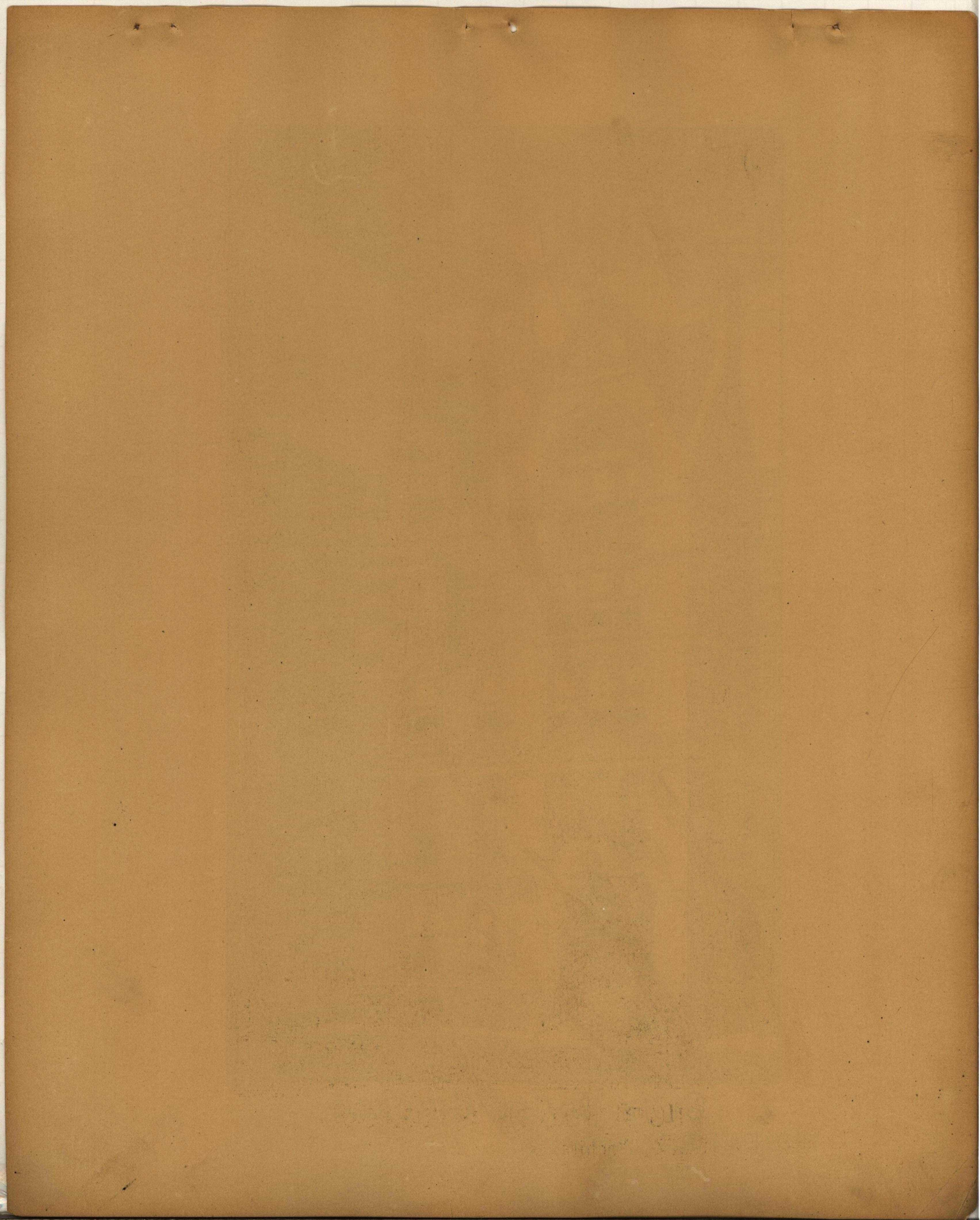


A. HOEN & CO. BALTIMORE, MD.

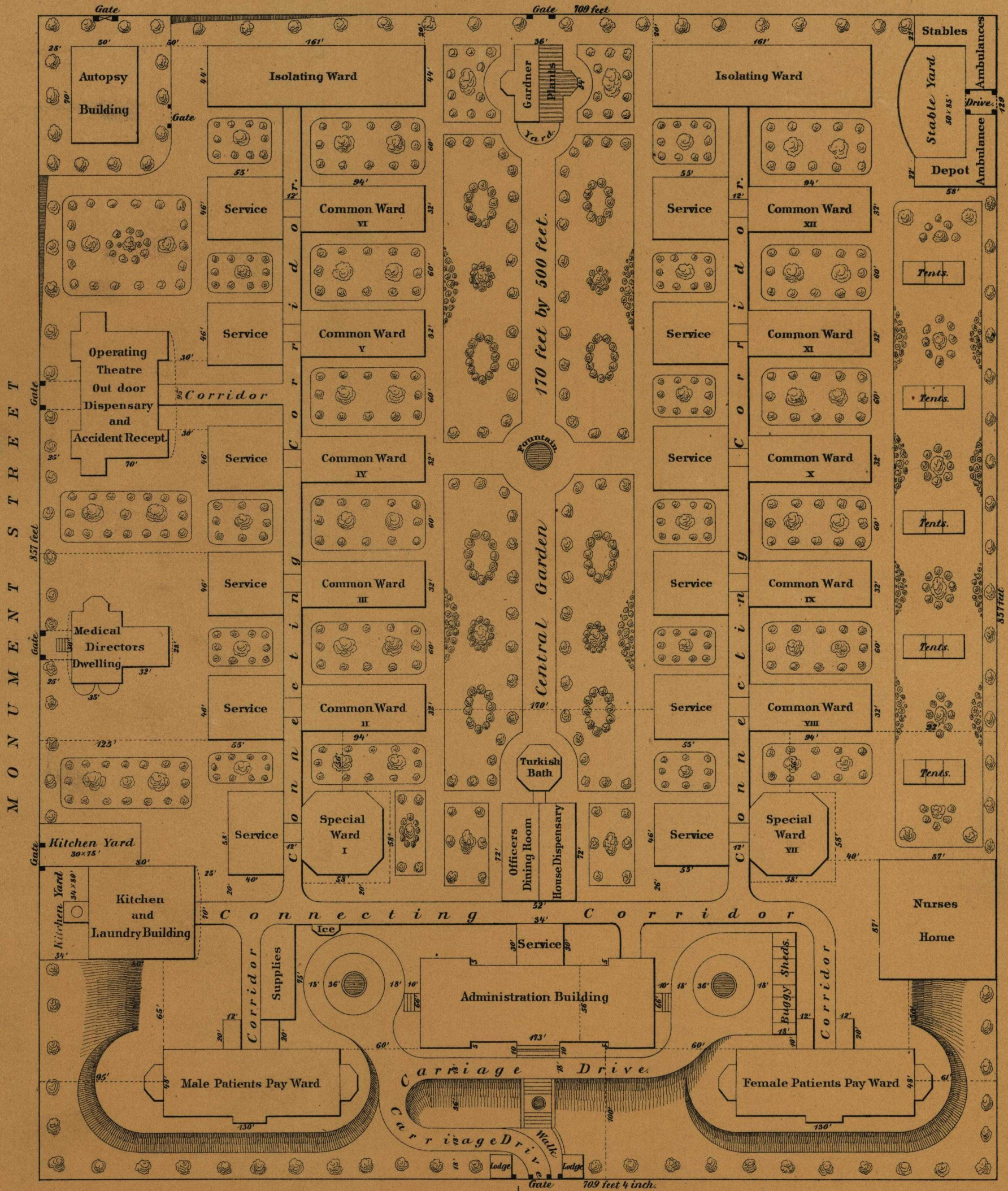
NEW YORK TRIBUNE BUILDING.
RICHARD M. HUNT, Architect.



CLUB HOUSE CHICAGO.
TREAT & FOLTZ, Architects.



BLOCK PLAN OF THE JOHNS HOPKINS HOSPITAL.



Scale 80 feet to 1 inch.

B R O A D

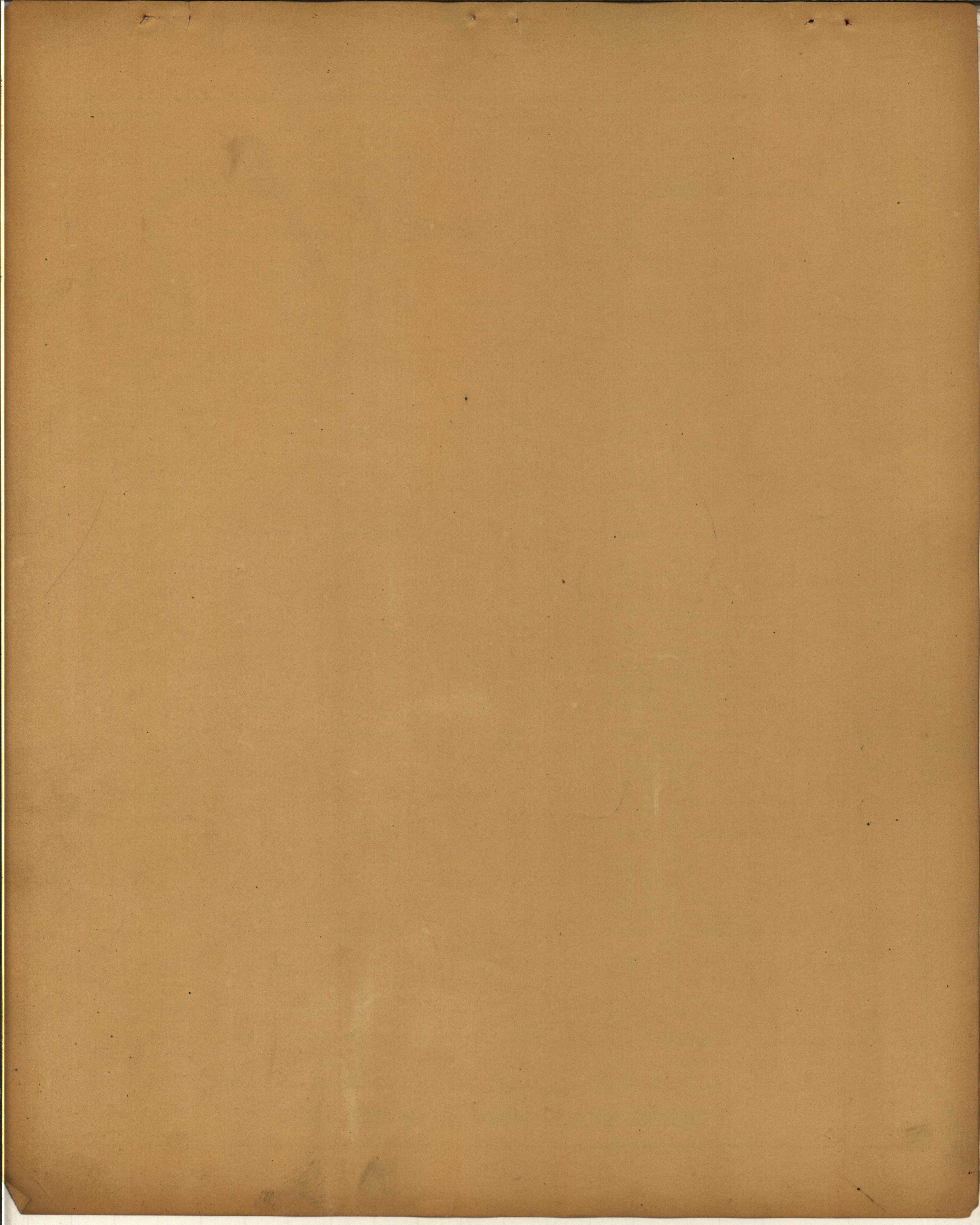


W A Y

130 feet wide.

A. Hoer & Co. Lith. Balto.

John R. Niernsee, Architect.
Baltimore, Md.

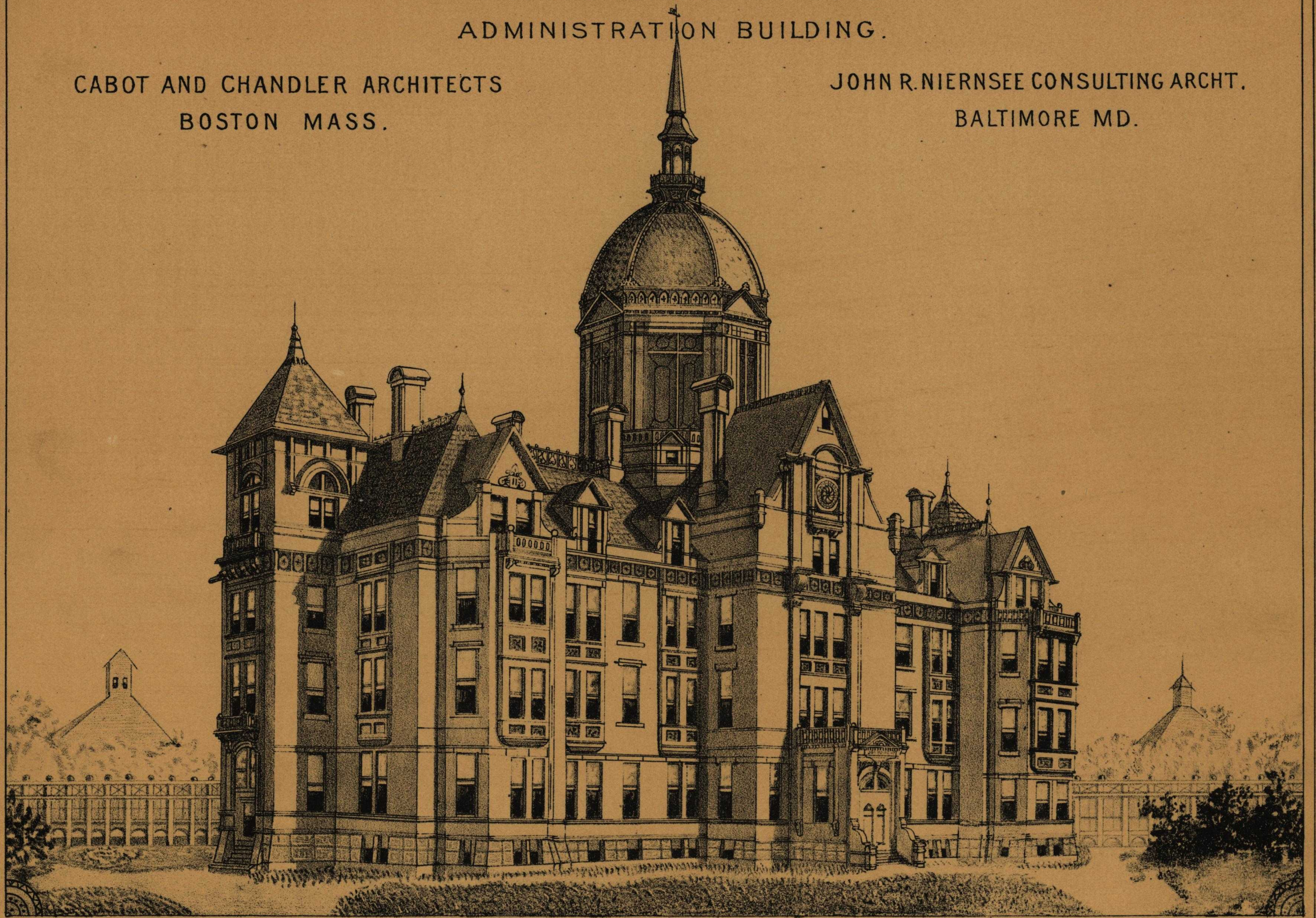


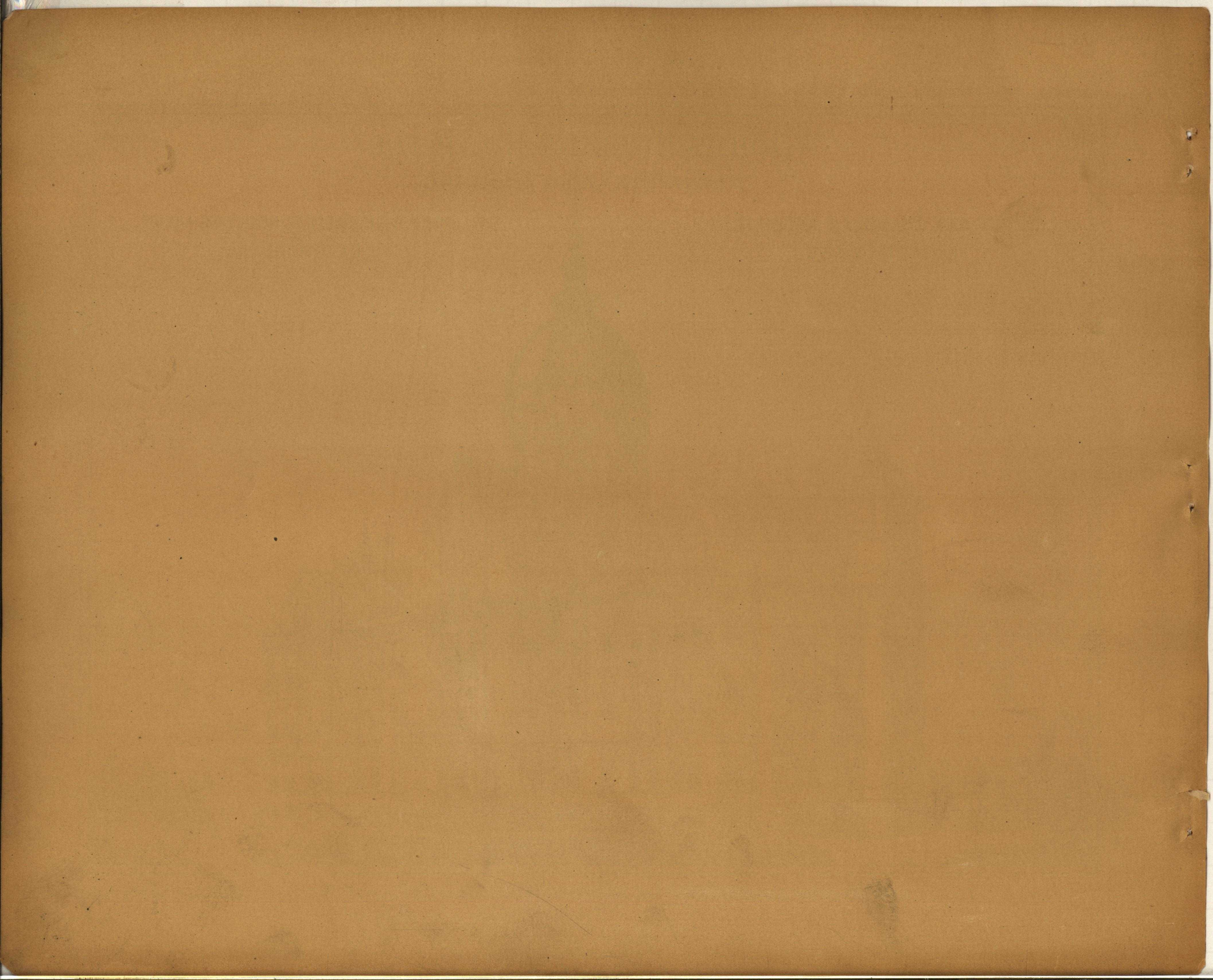
JOHNS HOPKINS HOSPITAL

ADMINISTRATION BUILDING.

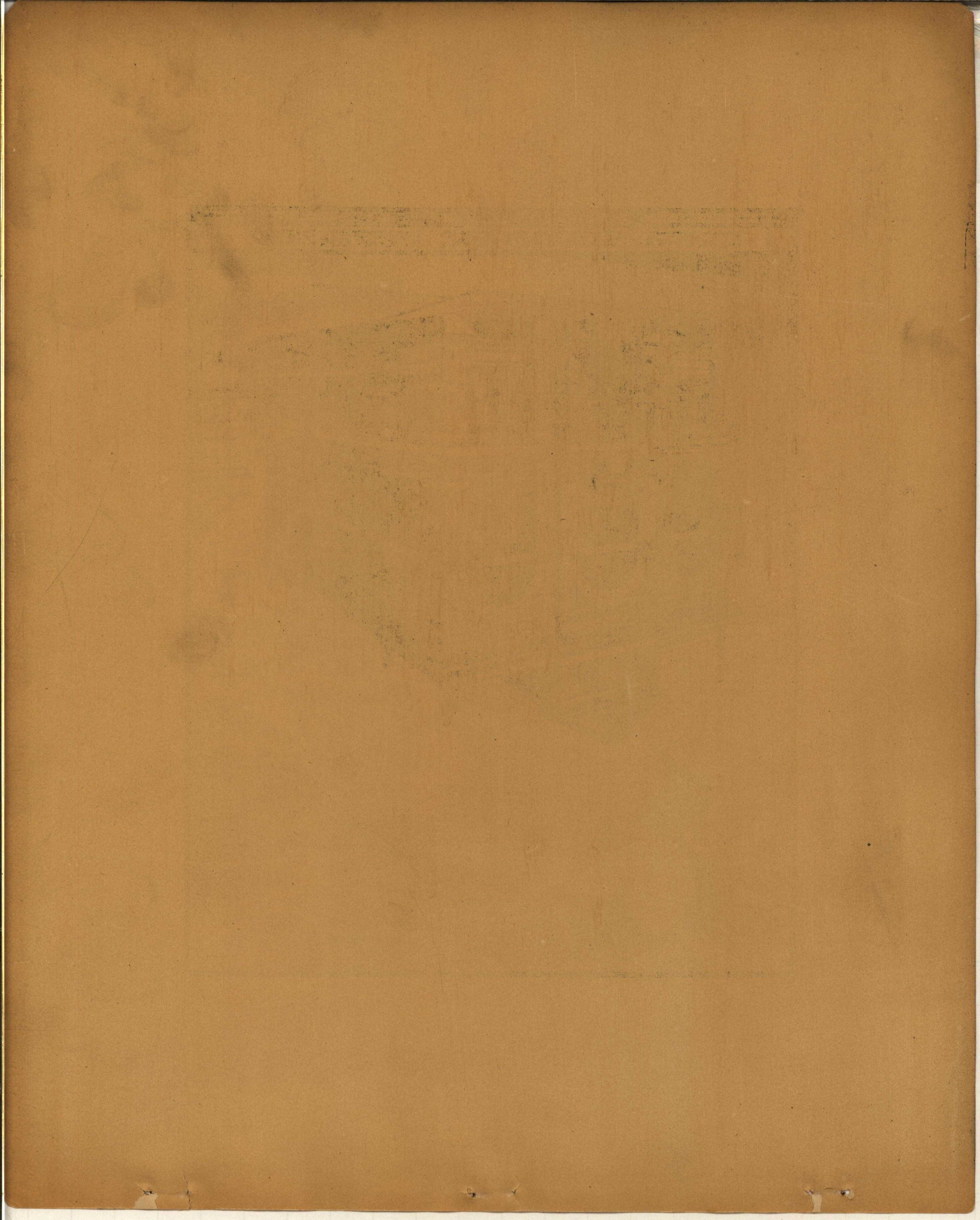
CABOT AND CHANDLER ARCHITECTS
BOSTON MASS.

JOHN R. NIERNSEE CONSULTING ARCHT.
BALTIMORE MD.





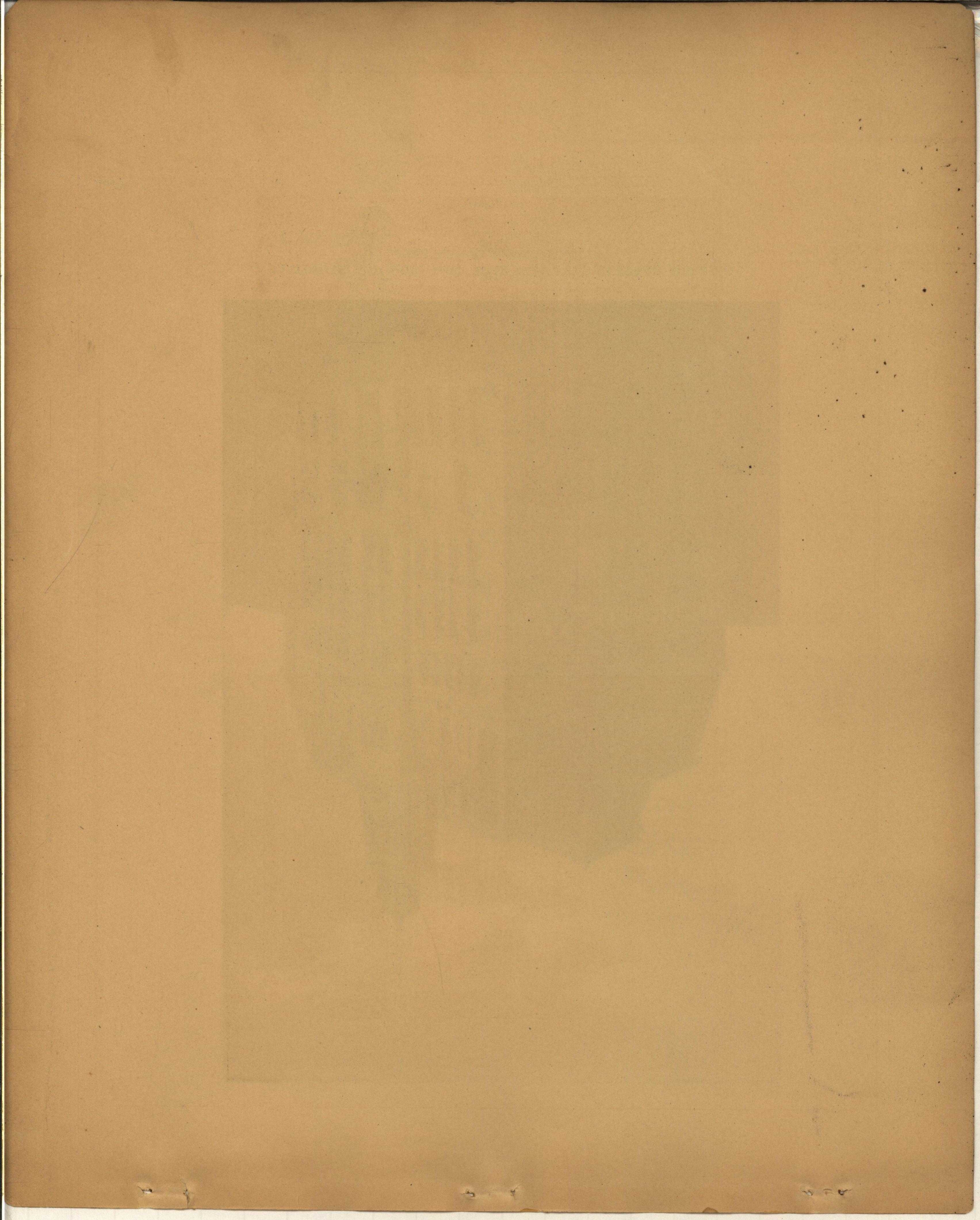






BALTIMORE AND OHIO RAIL ROAD COMPANY'S CENTRAL BUILDING.
FIRE-PROOFED THROUGHOUT.

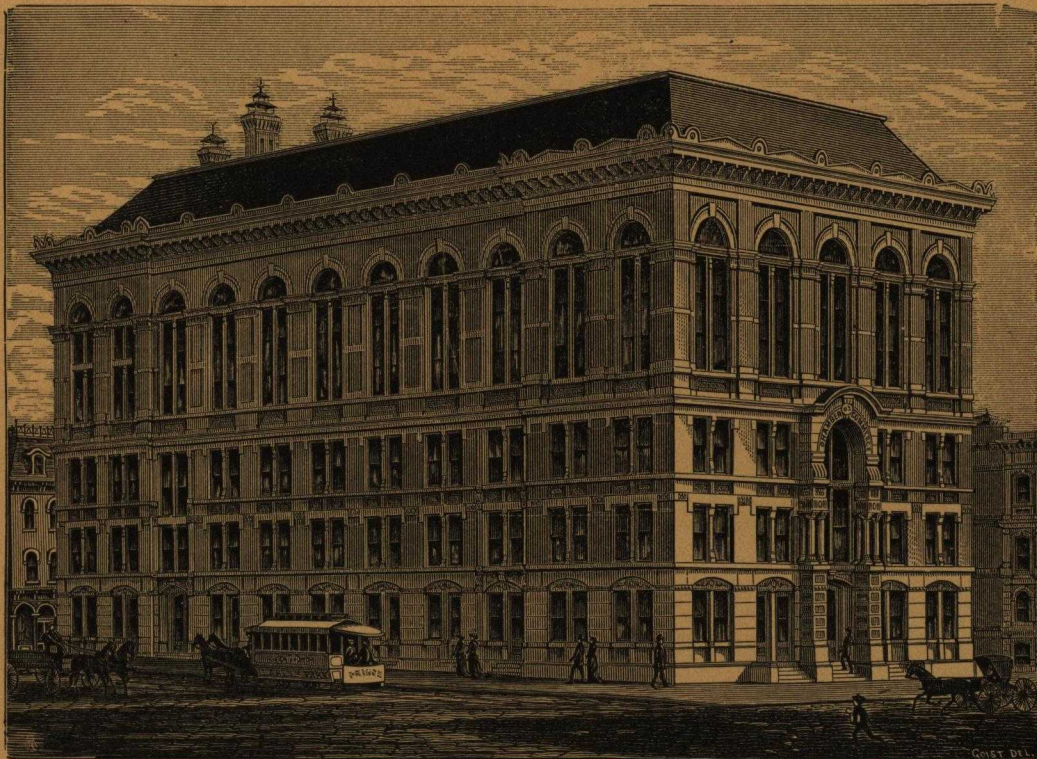
E. F. BALDWIN, Arch't,
Cor. Charles and Lexington Sts.





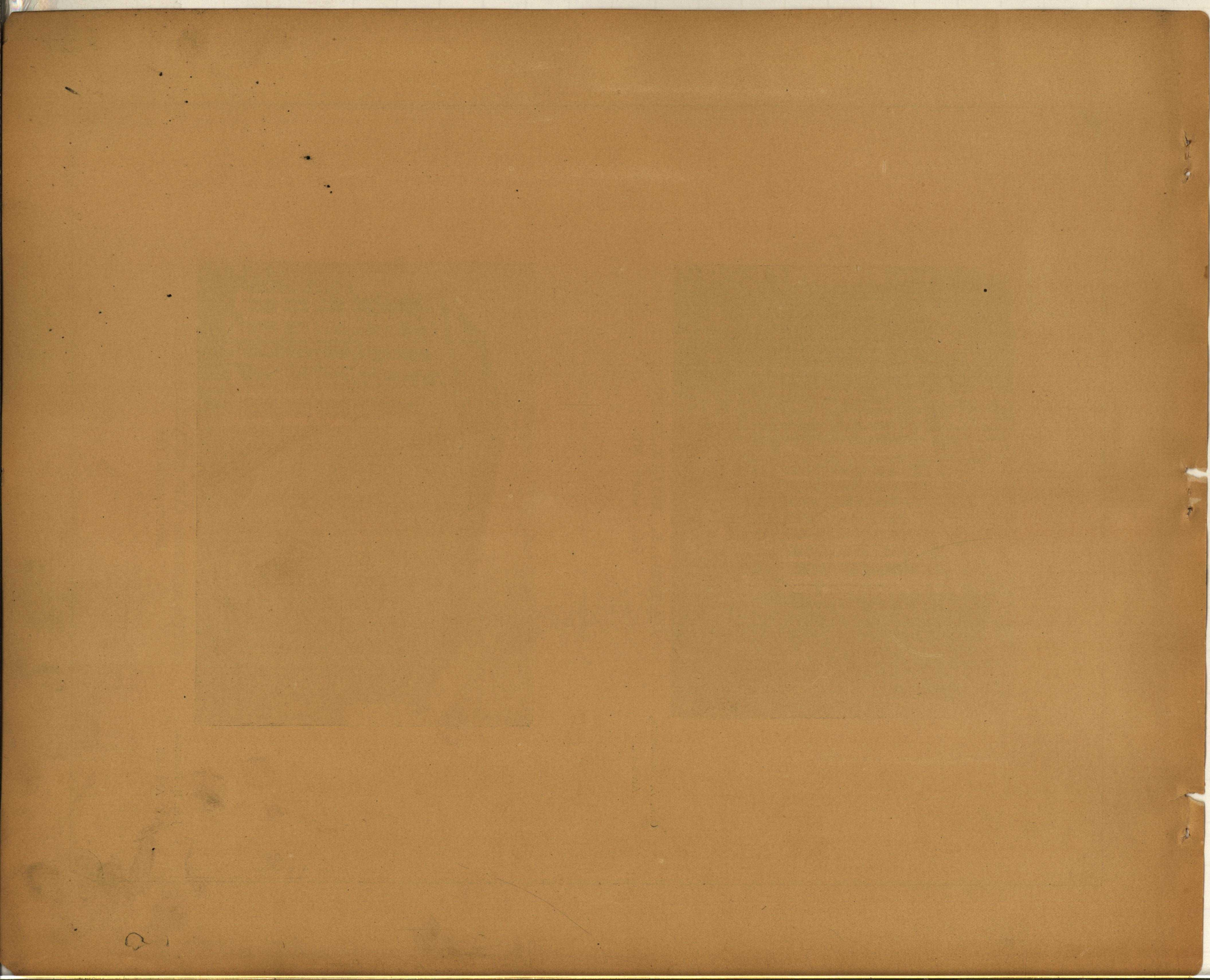
GEO. A. FREDERICK,
Architect.

ABELL BUILDING,
BALTIMORE, MD.



JNO. R. NIERNSEE,
Architect.

CHAMBER OF COMMERCE,
BALTIMORE, MD.





THE HOEN BUILDING.

Lexington St. Opposite the City Hall.

Occupied by A. Hoen & Co. Lithographers.
Established 1835.

Building Erected 1880.
W. F. Weber, Architect.





